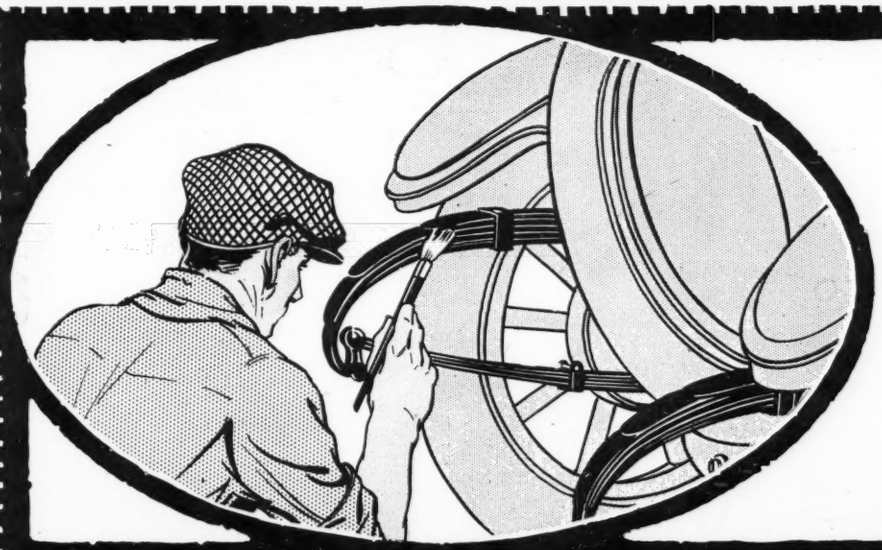
MOTOR AGE

Vol. XXXII
No. 11

CHICAGO, SEPTEMBER 13, 1917

Ten cents a copy
Three dollars a year



It Seeps Between the Spring Leaves

JOHNSON'S Stop-Squeak Oil

THE irksome task of jacking up a car, prying apart the spring leaves and lubricating them is forever done away with. You, yourself, can now keep your springs thoroughly lubricated at all times. You won't require a tool of any kind—it isn't even necessary to jack up the car.

Makes Your Car Ride Easily

Johnson's Stop Squeak Oil is a simple remedy for hard riding cars. Instead of bumping over the road, you can fairly float along if your springs are lubricated so you have spring action. Johnson's Stop Squeak Oil reduces the liability of spring breakage.

Johnson's Stop-Squeak Oil is unexcelled for removing squeaks of all kinds—in springs, shackle bolts, body, hood, fenders, top, etc. Just locate the squeak and touch it with Johnson's Stop-Squeak Oil. You can paint it on with a brush or squirt it on with an oil can.

Insist upon your dealer supplying you with Johnson's Stop-Squeak Oil. If he is unable to do so, send your order direct to us—we will prepay the express to any point in the U. S. East of the Rockies.

Quarts.....$ .85 **Pints**.....$ .50

Write for our Folder on "Keeping Your Car Young"—It's Free.
S. C. JOHNSON & SON, : Dept. MA : RACINE, WIS.

Editorial Contents—Page 3

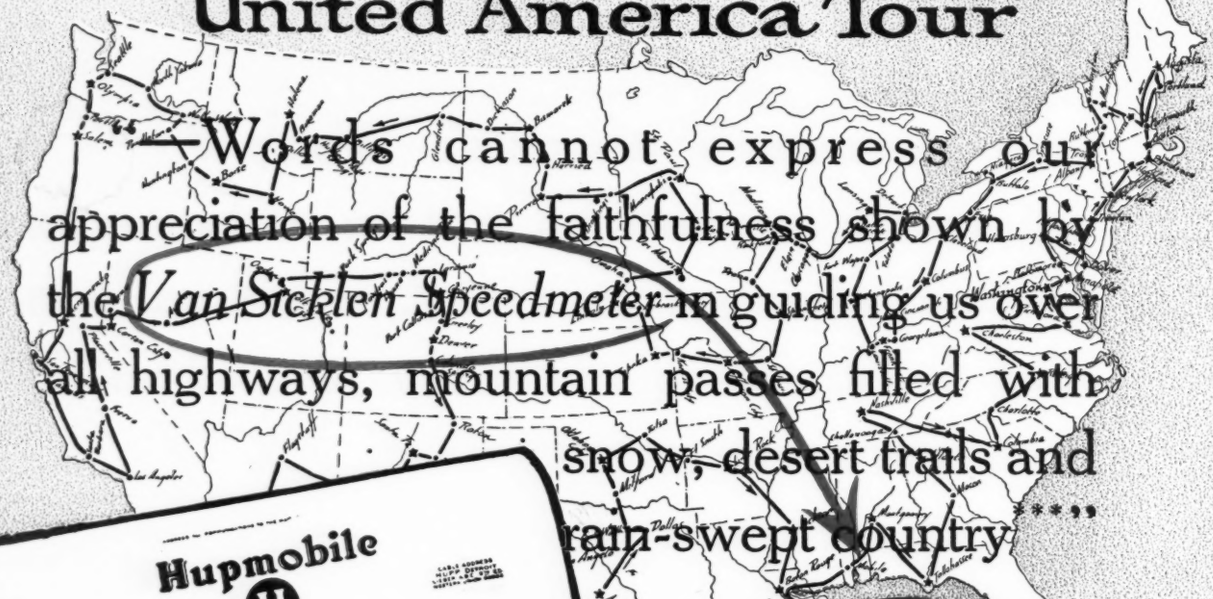
Advertisers' Index—Next to Last Page

In This Issue—The Thirteenth Car

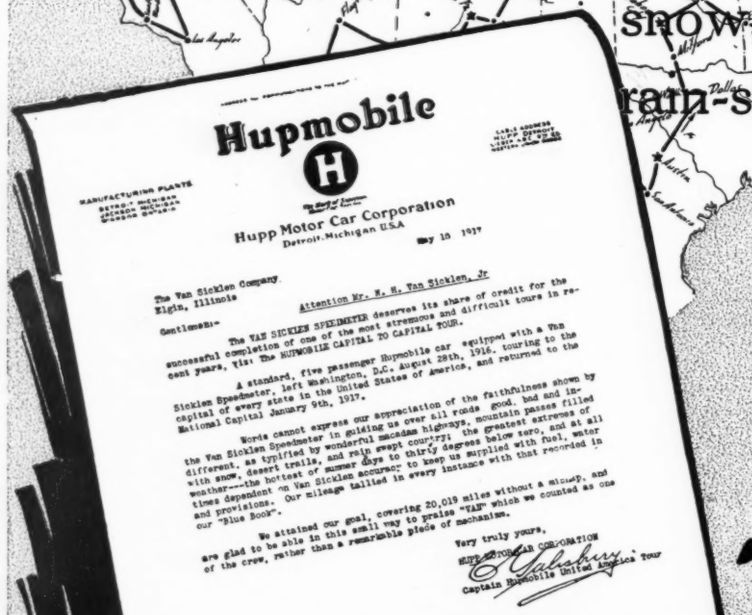
Van Sicklen +

HUPMOBILE

United America Tour



"Words cannot express our appreciation of the faithfulness shown by the *Van Sicklen Speedmeter* in guiding us over all highways, mountain passes filled with snow, desert trails and rain-swept country ***"



Hupmobile

Hupp Motor Car Corporation
Detroit-Michigan U.S.A.

May 15 1917

The Van Sicklen Company
Elgin, Illinois

Attention Mr. E. E. Van Sicklen, Jr

Gentlemen:-

The VAN SICKLEN SPEEDMETER deserves its share of credit for the successful completion of one of the most strenuous and difficult tours in recent years, viz: The HUPMOBILE CAPITAL TO CAPITAL TOUR.

A standard, five passenger Hupmobile car equipped with a Van Sicklen Speedmeter, left Washington, D.C. August 28th, 1916, touring to the capital of every state in the United States of America, and returned to the National Capital January 9th, 1917.

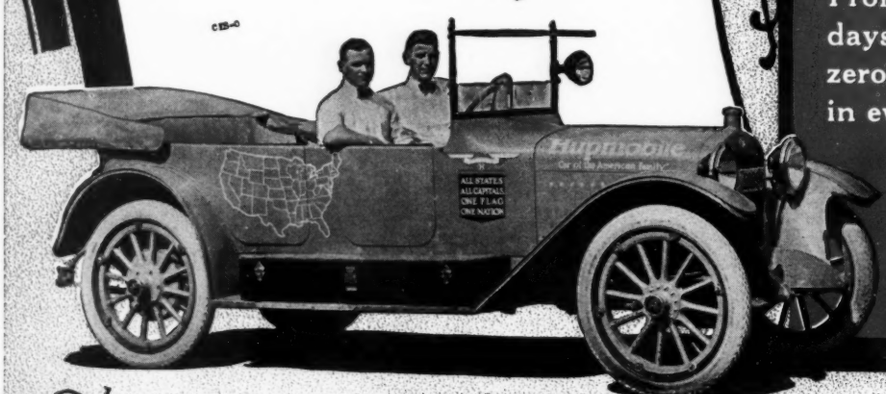
Words cannot express our appreciation of the faithfulness shown by the Van Sicklen Speedmeter in guiding us over all highways, mountain passes filled with snow, desert trails, and rain swept country, the greatest extremes of weather---the hottest of summer days to thirty degrees below zero, and at all times dependent on Van Sicklen accuracy to keep us supplied with fuel, water and provisions. Our mileage tallied in every instance with that recorded in our "Blue Book".

We attained our goal, covering 20,019 miles without a mishap, and are glad to be able in this small way to praise "VAN" which we counted as one of the crew, rather than a remarkable piece of mechanism.

Very truly yours,

HUPP MOTOR CAR CORPORATION
Captain Hupmobile United America Tour

CEH-C



"From hottest of Summer days to 30 degrees below zero*** Our mileage tallied in every instance with that recorded in our Blue Book."

Catalog of Van Sicklen Speedmeters mailed on request.

The Van Sicklen Company — Elgin Illinois Factory — Elgin National Watch Co.

MOTOR AGE

Published Every Thursday by the
CLASS JOURNAL COMPANY
Mallers Building
CHICAGO ILLINOIS

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, Under Act of March 3, 1879—Member of the Audit Bureau of Circulations—Copyright, 1917, by the Class Journal Co.

United States, Mexico and U. S. Possessions One Year $3.00
Canada .....One Year $5.00
All Other Countries in Postal Union.....One Year $6.00

BEWARE OF SUBSCRIPTION SOLICITORS OFFERING PREMIUMS OR CUT RATES—ALL CURRENCY SHOULD BE SENT BY REGISTERED MAIL.

RENEWALS or CHANGES OF ADDRESS should be sent two weeks in advance of date they are to go into effect. Be sure to send old as well as new address to avoid unnecessary delay. RECEIPT of first copy is acknowledgment of subscription.

Vol. XXXII Chicago, September 13, 1917 No. 11

Contents

YE KNIGHTS OF YE THIRTEENTH CAR..... 5
EDITORIAL—AVIATION MECHANICS—CUTTING OUT THE CUT-OUT—WATCH THE FUEL LEAKS 12
OCTOBER CHICAGO RACES..... 16
ILLUMINATING HEADLIGHT LAWS..... 18
MARYLAND'S WONDERFUL RIDGE ROAD..... 20
"HOW'S THE MOTOR BUSINESS?"..... 23
TALES OF THE ALLEY RATS—I..... 24
MOTOR PIONEERING IN B. S. A..... 26
MAKING THE SHOW CIRCUIT..... 29
ELECTRICAL EQUIPMENT OF THE MOTOR CAR 30
MOTOR CAR DEVELOPMENT..... 40

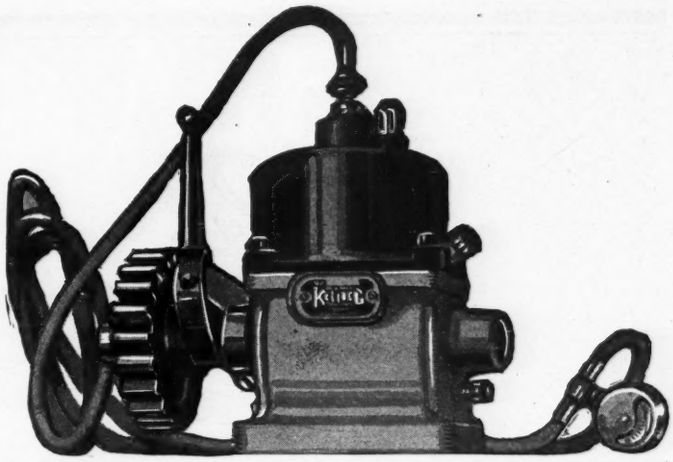
The Nash six, Sayers six, Detroit de luxe sedan for Ford cars, Wolverine speed special and new Murray described and illustrated.

DEPARTMENTS

A. B. C. OF AVIATION..... 32
OWNER'S GARAGE 34
MOTOR CAR REPAIR SHOP..... 35
READERS' CLEARING HOUSE..... 36
ACCESSORY CORNER 44
AMONG THE MAKERS AND DEALERS..... 46
FROM THE FOUR WINDS..... 48

NEXT WEEK

Never before has the United States needed permanent highways as now. Next week MOTOR AGE will publish a special two-page map showing just where these roads are most needed to serve the military organization of the country. In addition you will see how Uncle Sam is mobilizing his first million soldiers.



A Pump that Challenges Poor Tire Adjustments

KELLOGG Engine Driven Tire Pump

A tire to give exceptional endurance, long life, vitality and also secure good adjustments for the owner must **be kept up to proper pressure at all times.**

Many manufacturers have chosen the KELLOGG as standard equipment because properly inflated tires mean much for the comfort, convenience and economical service of the automobile.

The KELLOGG is also recommended and used because of these exclusive features:

"No Oil Spray"—Guaranteed
"All Metal Construction"—Everlasting

Is Your Car Here?

BUICK
CHALMERS
CHANDLER
CHEVROLET
DODGE
FORD
HUDSON
HUPMOBILE
KISSEL
NASH
OLDSMOBILE
OVERLAND
PAIGE
REO
STUDEBAKER

Dealers equip these cars and many others

If your car is not already equipped with the KELLOGG, you will find a place on your car designed for it.

Send name and model of your car, Dealer's name appreciated

KELLOGG MFG. CO.
ROCHESTER, N. Y.

Branches and distributors in all principal cities.

Studebaker

The demand for Commercial Cars is constantly increasing

Studebaker dealers, in addition to an attractive line of passenger cars, also have a complete, distinctive line of high grade ½ ton and 1 ton Commercial Cars to sell.

This insures the Studebaker dealer a steady, profitable business all the year 'round.

If there is no Studebaker dealer in your territory, write today for detailed information.

STUDEBAKER

Detroit, Mich. **South Bend, Ind.** **Walkerville, Ont.**

Address all correspondence to South Bend

It pays to be a Studebaker dealer

Vol. XXXII, No. 11 Chicago, September 13, 1917 $3.00 Per Year

MOTOR AGE

Ye Knights of ye Thirteenth Car

by Ruth Sanders

THIRTEEN, where is thy sting! How weak is the dragon of superstition in the might of thy knights! For when a man goes so far as to issue more than a million license tags in five years and does therein willfully and knowingly pick for himself the thirteenth as the flower of them all, then something is the matter with the hoary old dragon of superstition and the fire of its nostrils availeth not other than to illuminate the license tag on the fore end of ye knight of the thirteenth car's vehicle.

Through thy agency, oh thirteen, man has found the one maiden, mortal weaknesses of tire and engine have been overcome and countless other miracles have made for the glorification of the car with the eery number.

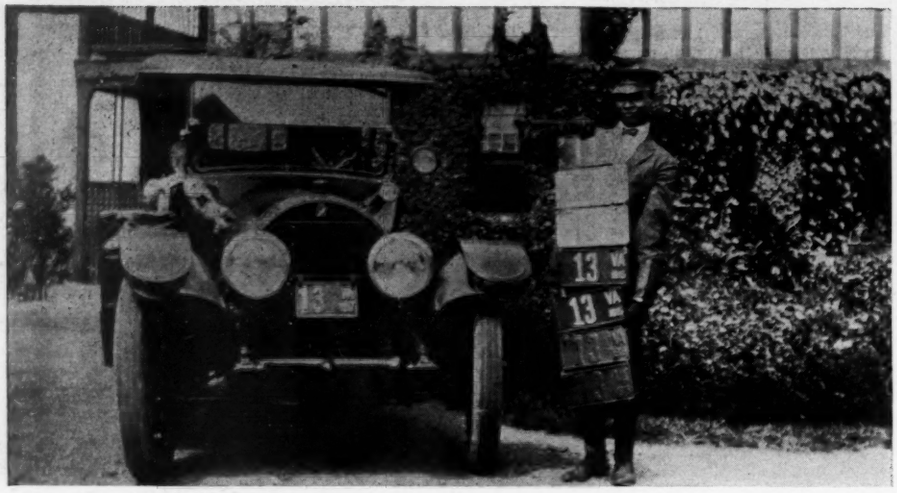
Thirteen letters in this car's cognomen.
Thirteen thousand helped this man win.
Thirteen years a merchant chief.
Thirteen lulls this man to sleep.
Thirteen and 6500 miles hurt-free.
Thirteen and 7000 miles without mishap.
Thirteen marks these folks' birthdays.
Thirteen keeps that car insured.
Thirteen lived when other cars burned.
Thirteen wanted to have his car.
Thirteen makes the show seem brighter.
Thirteen years with one concern.

More of thy wonders, oh thirteen, could we tell, if it were not that your owners, the knight, have done it better.

Amos Richardson, chief clerk of the motor vehicle department of the secretary of state's office, Springfield, Ill., is Illinois' knight of the thirteenth car. Yet Mr. Richardson is the man who issues all the numbers and could have had practically any other number. He it is who during the last five years has issued more than a million licenses, 1,120,000 to be exact, for which fees amounting to $4,500,000 were collected. Mr. Richardson bought his car Friday, Nov. 13, 1913.

Emery A. Odell, postmaster at Monroe, Wis., had thirteen "wished on him," so to speak. Three years ago a friend in the office of the secretary of state mailed it to him as a joke. Mr. Odell was then postmaster under President Taft and a lively contest for the office was budding in Mon-

A million license numbers to choose from and he chose thirteen!



The chauffeur's string of license plates, each a thirteen, shows W. C. Stephenson of Roanoke, Va., is quite a collector of thirteens

roe. As Mr. Odell soon afterward received his appointment, the joker at once claimed credit for it. Naturally, Mr. Odell has been a true knight ever since. He is the publisher of a daily newspaper established by him twenty years ago, the initial issue bearing date of Friday, the 13th.

Thirteen a Noble Player

Far more romantic are the incidents in the career of one knight, who for obvious reasons goes nameless here. Like Don Quixote of windmill fame, he, too, went forth and found adventure. Thirteen came to him in January and just thirteen days after receiving it while driving through the country one beautiful, though rather cold, moonlight night, all alone in his car, he came upon another car exactly 13 miles from Fort Sumner. The car was standing in the middle of the road, and someone was curled up in the seat. Like a true knight of the thirteenth car he stopped, nothing loth to rescue a fair maiden in distress. It seemed she had started out for S—— from a neighboring town, where she was visiting, and as there was no one to take with her she started out alone. A series of mishaps delayed her and finally to make matters worse she ran out of gas.

Our knight brought her in to S—— to her friend, but not before they had driven together far enough to become quite good friends. What was more natural, later, than that the knight should call to see how she fared? He has visited her several times since then and expects by this time next year to be no longer a knight in a lonely castle. Thirteen played a noble part. He met her thirteen days after he had been dubbed a knight of the thirteenth car. It was just 13 miles from town. She had started out with 13 gal. of gas, which leaked away. The knight's birthday comes Dec. 26 and hers Dec. 13, just thirteen days apart. And the knight is just thirteen days less than thirteen years older than the maiden.

Keith W. Edwards of Fort Sumner, N. M., believes thirteen has been more than lucky for him since he has been a knight. The upkeep has been less this third year than it was the second year, and in addition it guarded him right royally several weeks ago when he drove his car to Roswell, N. M. He left Fort Sumner late in the afternoon and due to some little tire trouble darkness overtook him 40 miles from his destination. Soon after dark a terrible electric and rain storm came up and continued for several hours. To make the matter worse he ran into a herd of cattle that was drifting with the storm, ready for a stampede which might carry them over the edge of one of the many canyons in that section to their death.

For the last 40 miles of this trip not a house of any description was within miles of the road. A protracted drouth had saturated the atmosphere with electricity and there had been many deaths by lightning during previous electric disturbances in the last few months. Mr. Edwards drove through an intense darkness relieved only by blinding flashes of lightning and nerve-racking crashes of thunder, the bolts of lightning threatening car and driver constantly. The cattle surged about the car, seemingly a vast wave of tossing horns and bawling, bellowing, terror-stricken brutes. The storm grew worse instead of better.

"The lightning flashed in one continuous barrage of fire, darting and jumping among the horns of those terrified, by this time stampeding cattle," writes Mr. Edwards, "and to the metal parts of my car, making it seem a veritable chariot of fire, and I am frank to say that I never felt nearer my Maker nor had a more deadly, awful fear in my heart than during those few moments, possibly 10 or 15, while these animals were drifting past me as I sat in my car, afraid and, in fact, unable to move either forward or backward, expecting that every moment would be my last."

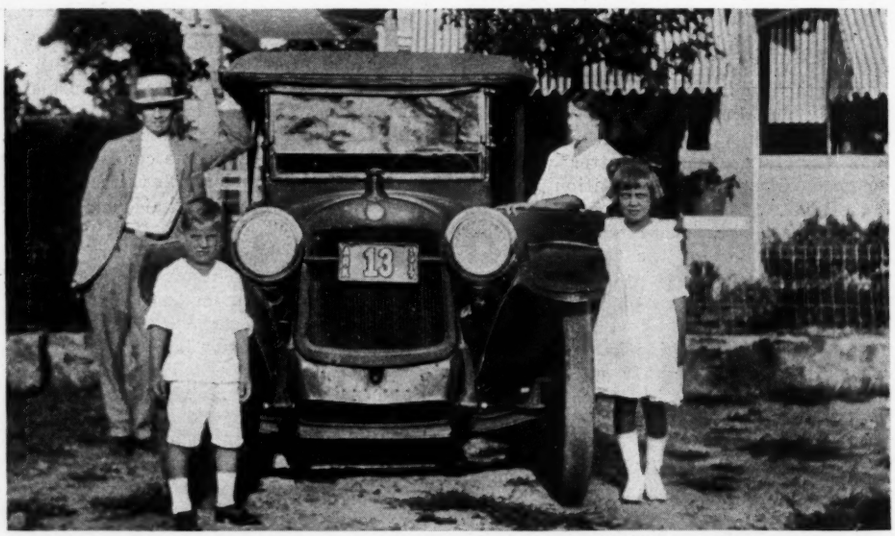
That he did come through the electric fire unhurt and with his reason left assures Mr. Edwards that thirteen can not be very unlucky for him, however unlucky it may have proved in the past to others.

George C. Gilman, or "Gil," of the Denver Post handles motor car advertising and has never had such good car luck in his life as he had since he obtained thirteen for his number. He "had a heck of a time" convincing the secretary of state that he needed it, he says, but the secretary finally relented and thirteen has been a faithful pal ever since. "Gil" did not spend a cent on his car for 6500 miles and then only $2.15 for a bearing he forgot to oil. He has not been pinched this year for violating city ordinances. He says all the cops believe in the hoodoo and are afraid to pinch a thirteen, but he hopes they will keep on being superstitious.

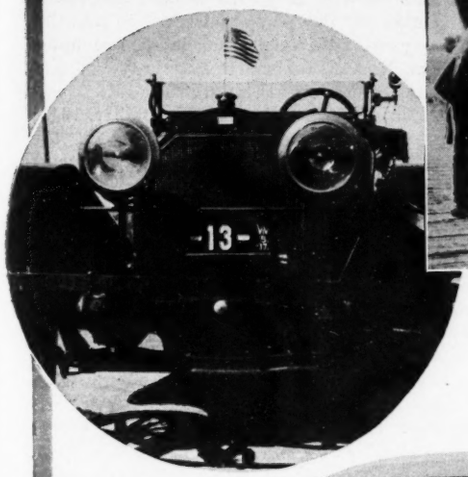
Statesmen Carry No. 13

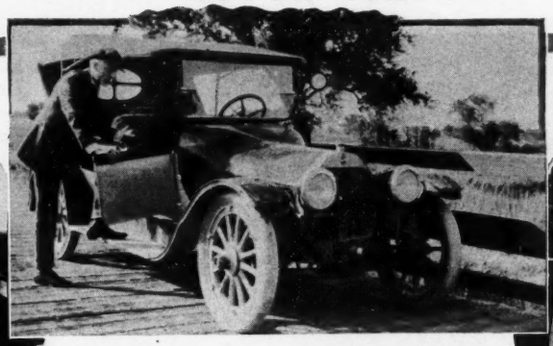
Thirteen counts some of our statesmen, too, among its knights. Among them are Otto Starzinger, Des Moines, Iowa, representative from Polk County; George W. Granger of the third judicial district, Rochester, Minn.; H. Herbert Steele, Bismarck, N. D., tax commissioner, and Tom J. Underwood, Washington, Pa., county controller of Washington County.

The first car which Otto Starzinger purchased carried the number 13131, entirely without design on his part. It was called to his attention so frequently during the time he had it that when he bought a new car in 1913, he asked for thirteen. This car was bought Oct. 13. In its second year, he opened winter quarters Friday, March



No hoodoo with R. G. Helborn here, only the family, the car and the owner's home. And yet thirteen is called unlucky

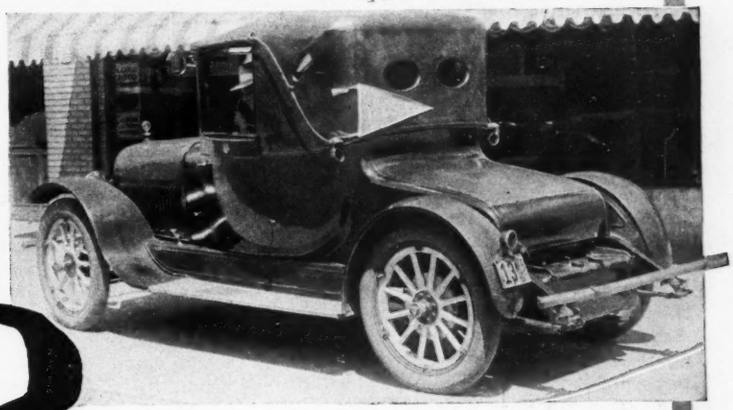




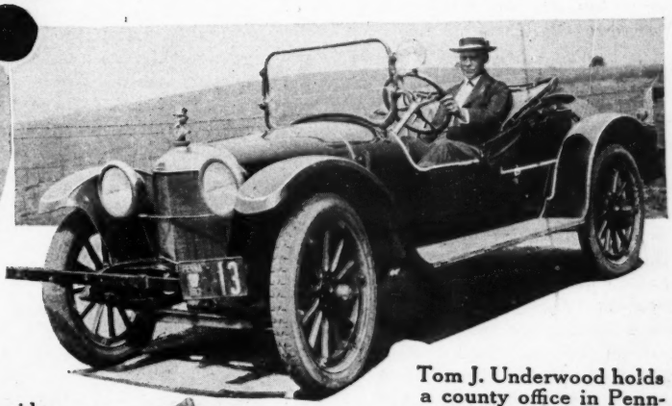
K. W. Edwards' car but not the owner. The car now is at Roswell after the big storm

The car to the right has been in use 7 years by J. L. Kuser. Below is E. W. Abbe's car

A joke gave E. A. Odell No. 13



Arthur Beckman drives his car with a number that cost him $50.50 — and thirteen at that

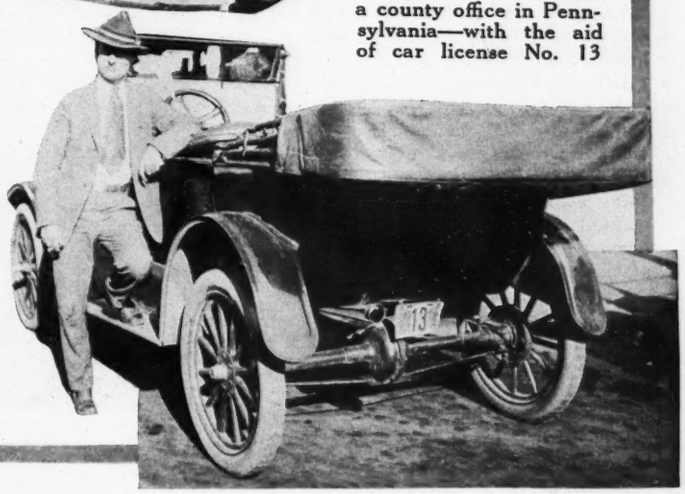


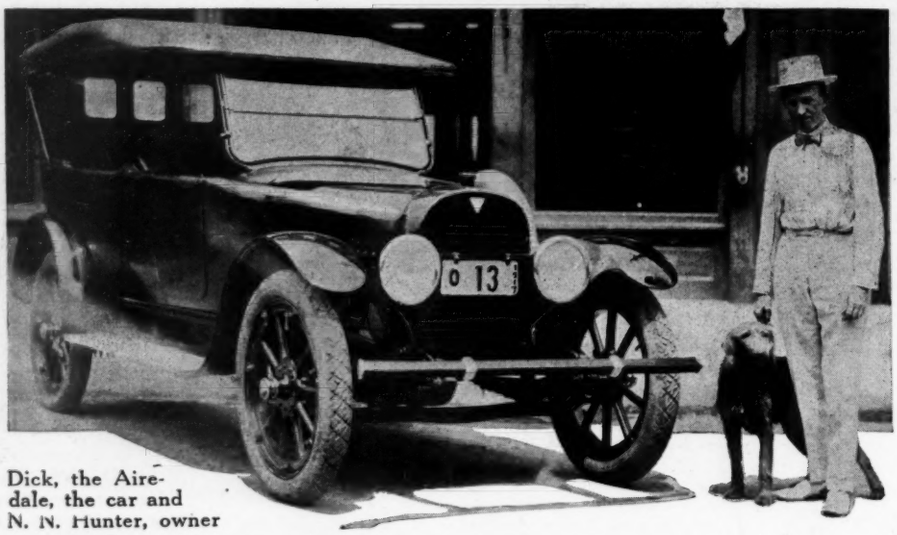
Tom J. Underwood holds a county office in Pennsylvania—with the aid of car license No. 13

One man refused to ride in this car, but P. R. Beard of Shelbyville, Ky., does not object to that number on his car

Iowa's car-for-every-ten-persons record is herewith represented by Otto Starzinger, holder of No. 13

Thirteen helps Gil of Denver — he advertises and so does the thirteen





Dick, the Airedale, the car and N. N. Hunter, owner

13, for his campaign for the office of representative. He was elected by a majority obtained by nearly 13,000 votes.

Tom J. Underwood is glad he was christened "Tom" instead of "Thomas" as the letters of his name total thirteen. His initial adventure in politics was in 1913, when he first was elected controller. When he became a candidate for re-election he was particular to file his nomination petition Friday, July 13. His petition was the thirteenth filed with the county commissioners and bears that number in stamped figures. His petition required 100 signatures, but he obtained 113 and filed it 13 min. after 9 o'clock July 13. Mr. Underwood was born Sept. 13, has been in the real estate business thirteen years, was the 113th member received in the Washington Country Club, and owns thirteen pieces of real estate at California, Pa.

Thirteen a Regular Number

Judge George W. Granger has carried thirteen on his cars since 1912 and expects to have the same number next year, in which case he will remain a knight of the thirteenth car for three years more. His reason for requesting this particular number is that his wife, in professional life Dr. Booker-Granger, was born Friday, the 13th, and considers that her lucky number, as does he. This is Minnesota's No. 13.

Two hundred persons refused to carry thirteen on their cars in North Dakota this year, but H. H. Steele believes there is nothing in superstition except as one puts something into it, and so he is North Dakota's knight of the thirteenth car. That thirteen has brought him luck has been demonstrated by his car. Last year the car ran only 1200 miles and was a continuous trouble. When Mr. Steele was offered thirteen for his license he took it—if anything could put that car of his in bad he wanted it. What happened? The car had been a constant visitor for almost a year at the agency's garage, with whose repair department it remained on the most intimate terms. No sooner had it been clothed with its enameled thirteen than it took up a three-week's stay at the shop. At the end of that time it went home, and 6 hr. later the garage burned and with it thirty-seven other cars. Since then this thirteenth car has met other repairmen and runs fine. With thirteen the owner is no longer afraid of breakdowns, his greatest concern being the speed limit and policemen.

Quinn J. Thomas' car has run 8644 miles and has the original tires. The front right tire went 8244 miles without a puncture; the left, 8644. Mr. Thomas, who is a general contractor and builder at Highland Park, Mich., has been driving cars five years and has had the best of luck.

A regular string of thirteens surrounds the car of one knight. He bought his car Friday, Jan. 13, 1915; had No. 13 for three years; had No. 1313 for one year; drove car thirteen months without a puncture or blow-out; was hauled in 13 miles about a year ago on account of stripped gears; has had thirteen in his car many times; went to a funeral Friday, the 13th; has had thirteen offers to trade the car; kept the car in garage thirteen months; now keeps the car in a garage on Thirteenth street.

The owner of these thirteens left home for California on train No. 113 and occupied berth No. 13 all the way out. There were thirteen Masons in the crowd; they gave thirteen concerts; thirteen numbers on each program; reached San Francisco on the 13th; thirteen of the party missed getting lunch on the ferry on the way over to San Francisco; attended luncheon at which it was the 13th anniversary of a member of the party; his father was the youngest of thirteen children; has occupied room No. 13 for more than a year; was made a Mason Friday, the 13th; was elected master of his lodge December, 1913; has put on the thirteenth degree of the Scottish Rite for several years until lately; was district deputy grand master one year and had thirteen lodges to inspect. How's that for a record?

P. R. Beard, cashier of the Citizens Bank, Shelbyville, Ky., has had no unusual experiences since using the thirteenth number but has had one man refuse to ride in his car on account of it.

Bert A. Boyd, president of a commission house in Indianapolis, has owned the thirteenth car for several years. His closed car has No. 13 and his touring car, 1313. His chauffeur's license number is thirteen and the Hoosier Motor Club has assigned this number to his membership card for several years.

Mr. Boyd believes in thirteens so hard he has No. 1313 as well as No. 13. Ever since he was a kid, he says, he has felt partial toward the number. He also has a chauffeur who began working for him in 1913 and is proud of the number.

E. W. Abbe has been a knight of the thirteenth car since 1907 and has never had an accident except to run over one or two chickens and a dog or two, a good record in view of his car ownership since 1900, when he bought the first car that came to New Britain, Conn. Before he obtained No. 13 it had been just refused. Mr. Abbe suggested the secretary give the other man 113, which he did, and then Mr. Abbe discovered it was a friend in New Britain.

Hoodoo Works Backward

R. G. Helborn, cashier and manager of the bond investment firm of Bond & Speer & Dow, has had No. 13 three years, first getting it in 1915, when his car gave him so much trouble he decided to put on the hoodoo number to see if it would bring results. When traveling Mr. Helborn likes berth No. 13 or hotel room No. 13, though he wants it strictly understood he was not born on Friday, the 13th. He bought his first car Friday, the 13th, however. Though

The thirteenth car in Michigan this year carries tire records of 8244 and 8644 miles. It is owned by Quinn J. Thomas

this may be the cause of his good luck, he says, he attributes it to carefulness and Safety First. His telephone number is 813 and his street number 1013.

William C. Stephenson, Roanoke, Va., has plenty of connections with thirteen aside from his car. He was born July 13; married Sept. 13; his telephone number is 13; he is president of the Thirteenth Corp.; room No. 1313 on the thirteenth floor of the Bellevue-Stratford hotel in Philadelphia is known as his room; and he has had license No. 13 for the last five years. His friends are aware of his liking for the number and he has an interesting scrapbook as the result of articles collected through them and others, which was started Jan. 13, 1902.

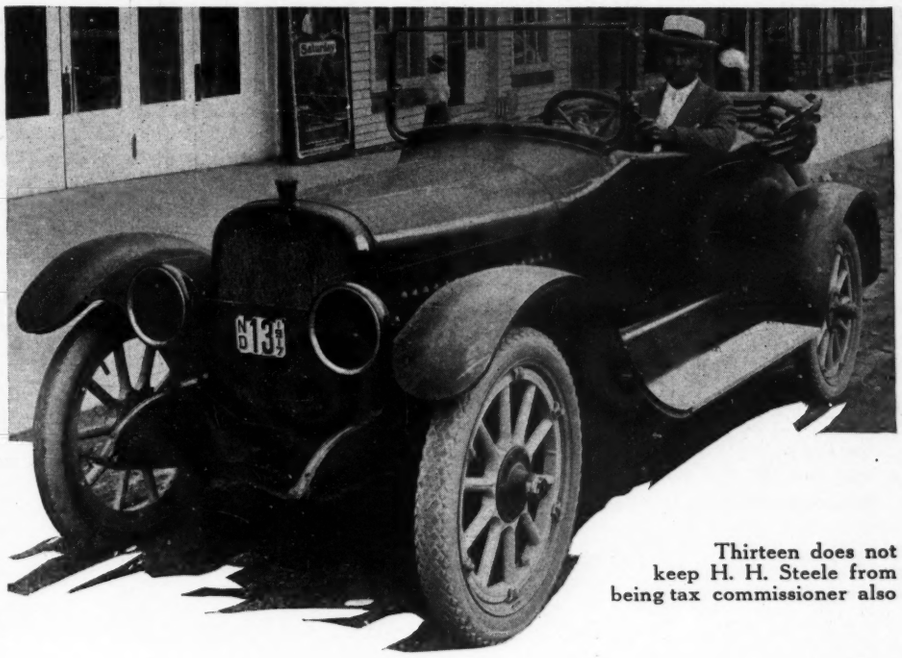
Thirteen letters has Arthur Beckman's name, so when he bought a car last year he wanted No. 13. He located the number at Hastings, Neb., and finally bought it for $50.50, the 50 cents being the transfer charge. He says he got it on a fifty-fifty deal. Mr. Beckman is a merchant at Lincoln, Neb., and has piled up a considerable mileage record without bad luck.

In more instances than one George M. Burbach, advertising manager of the St. Louis Post-Dispatch, has drawn No. 13, or a combination of it. Just now he is involved in thirteen as follows: His state license is 13; his county license is 13; his car insurance policy is 13; his home telephone number is Cabany 1313; his safe deposit box is 113; his club number at the Missouri Athletic Association is 1462, totaling 13; his locker box is 13; his clothes locker is 562, totaling 13; he was with the St. Louis Republic thirteen years; and came to the Post-Dispatch in 1913; his membership card in the Advertising Club of St. Louis is 13. If good fortune comes his way it usually comes on Friday, the 13th. At first the number 13 came to him so often by accident, and then his friends began to associate him with the number, so he now makes special efforts to get that number, as on his telephone, so his friends will never forget the number.

Thirteenth Brings Luck

For seven years one of the five cars owned by John L. Kuser, Trenton, N. J., has had license No. 13. In that seven years it has been run more than 70,000 miles without the slightest mishap. One time on the way to Odessa, Del., in 1913, passing through the outskirts of Philadelphia, a network of toll gates, a gate keeper noticed that he carried several guns and said, "Friend, I wouldn't go hunting on this day; it is Sept. 13, 1913, and the number of your car is 13; take my advice and turn back." When handing him the change for a quarter, it was 13 cents, which to the gate keeper made matters worse. But Mr. Kuser never had a more successful hunting trip.

H. W. Miller, vice-president of the Southern Railway System, Atlanta, Ga., says No. 13 happens to be his lucky number. The car that now carries No. 13 has been in operation three and a half years and has lost less than $50. The tires on No. 13 seem to wear longer and he has less punctures than a good many of his friends. He operated from June, 1916, to July, 1917, without a puncture, blow-out or, in fact, taking a single casing off the car. For several years he has insisted on No. 13 for his safety deposit box, and when a new insurance company started some years ago he took policy No. 13, making that a condition and waiting for about six months to date it on his birthday, which was three times thirteen, or thirty-nine. If there is a chance for him to take a trip on Friday, the 13th, he does it.



Thirteen does not keep H. H. Steele from being tax commissioner also

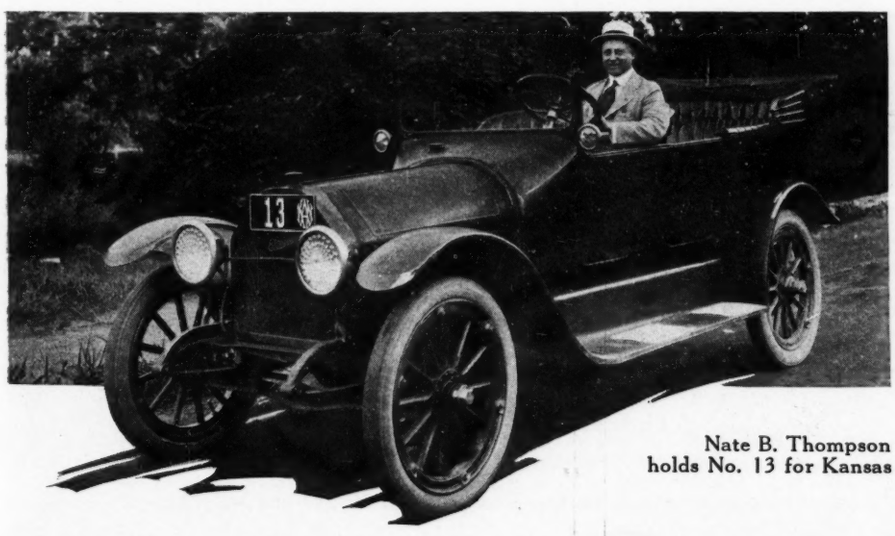
No. 13 for Massachusetts originally was issued to Sterling Elliott, Friday, the 13th. His first driver's license was No. 13, issued the same day. The number plate was fastened on with thirteen screws of No. 13 size. He takes stateroom No. 13—or sleeping car berth or hotel room—and never enjoys any show so much as when he has seat No. 13 in the thirteenth row. If the hotel calls room No. 13 room No. 12½ he enjoys it just as much, because it should be 13; Mr. Elliott tried to make MOTOR AGE believe he was born in 1813, but since he is still in the land of the living and at the head of the Elliott company that makes Elliott addressing machines at Cambridge, he lost his case.

One Woman "Knight"

Only one woman has had opportunity to assert "equal rights" with other "knights" of the thirteenth car, and this young woman, right logically since that state has produced one of the White House suffragists, is from Montana. Miss Charlotte Reeder, whose father owns a sheep ranch near Craig, Mont., holds No. 13 for Montana.

Ohio has two representatives here, Walter C. Baker of the American Ball Bearing Co., Cleveland, and N. N. Hunter of Jamestown, who represents the dealers with license No. 13. Mr. Hunter has had No. 13 for three years and before that had No. 23. He attributes many of his sales to the number, which attracts attention of those who otherwise might not notice his car.

No. 13 for Kansas is held by Nate B. Thompson of Topeka; Alabama, A. M. Owen, Ramer; California, Dr. Charles C. Browning, Los Angeles; Arizona, W. W. Cook, Phoenix; Delaware, George R. Carmichael, Wilmington; Idaho, P. E. Johnson, Rupert; Louisiana, A. W. McLellan, New Orleans; Maine, Arthur W. Clark, Portland; Mississippi, Merritt Woods, Natchez; New York, Joseph de Braga; Texas, W. Neal, Elkart.



Nate B. Thompson holds No. 13 for Kansas

Charles A. Maly of Brigham has the thirteenth car in Utah this year; F. L. Osgood of Saxton's River, Vermont; Robert F. Booth of Seattle, Washington; Samuel A. McCoy of Moorefield, West Virginia; H. J. Boice of Rock Springs, Wyoming; Everitt I. Rogers of Providence, Rhode Island; and Charles Alseth of Lake Preston, South Dakota.

Some of the states have no knights of the thirteenth car. New Hampshire starts with No. 100, Nevada with 10,000; Tennessee with 6000. Oregon issued no No. 13 for 1917, while four other states, South Carolina, Oklahoma, North Carolina and Maryland and Washington, D. C., have issued No. 13 to companies. No. 13 was issued by Florida in 1905 to C. G. Tousey of Winter Park, and according to the custom in that state he still retains that number.

How is This?

One knight has us stumped, and you will see why when you refer to his photograph. Dr. F. L. Osgood, Saxton's River, Vermont, is the knight in point. Doctor Osgood sends a photograph of his car No. 13, also his thirteen—count 'em—children. He is the thirteenth child; his father and mother were thirteenth children. He has driven a car thirteen years—thirteen different makes. His birthday is thirteen days after Sept. 13. When he was thirteen years old he received $13 and, says he, "what seems strange to me is, I still have them." Sept. 13 this had mounted to just three times $13.13, or $39.39. Doctor Osgood just now has thirteen farms and on twelve of them he has thirteen cows and on the other, thirteen pigs. We take his word for this.

Arthur W. Clark of Portland, Maine, was born on the 13th of the month, so was taught at an early age that the number thirteen should be lucky. The accompanying photograph was taken at the end of a 2000-mile trip, in which he drove to Toronto, Ont., and back without trouble of any kind, not even a puncture. For the trip he averaged 28¼ m.p.g. and used 4 qt. of oil, going through the Berkshire Hills, Green mountains and the White mountains and getting back in twelve days.

E. W. Hughes, a manufacturer at Piney Flats, Tenn., was born with a streak of superstition, so it was with some misgivings he drew No. 6013 for his car—here 6013 corresponds to 13 in other states. He says:

"I have had black cats cross my path and have been pinched in towns that looked like they needed the money but have had no trouble that defied analysis until you ordered me to have her picture taken. She just naturally defied the camera. I hired a timid artist who shied a little at the number, tried hard several times to get her likeness but finally got rattled and fled. I finally got a fair picture of the outfit, but don't ever ask me to do it again."

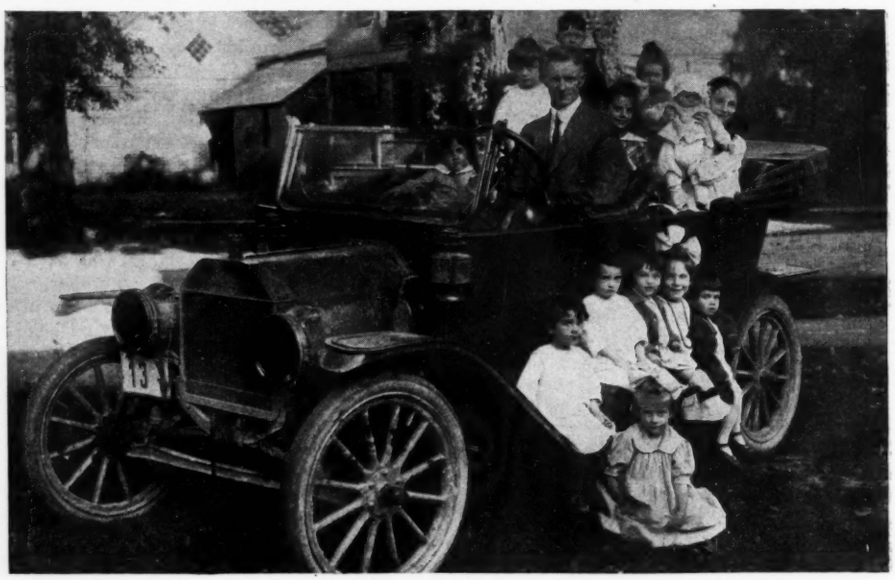
Sam A. McCoy, who publishes the Moorefield Examiner, Moorefield, W. Va., applied for No. 13 so he could try out the hoodoo but so far has found it about as lucky, if not more so, than other numbers he has met.

May they all find good luck in thirteen—as most of them have!

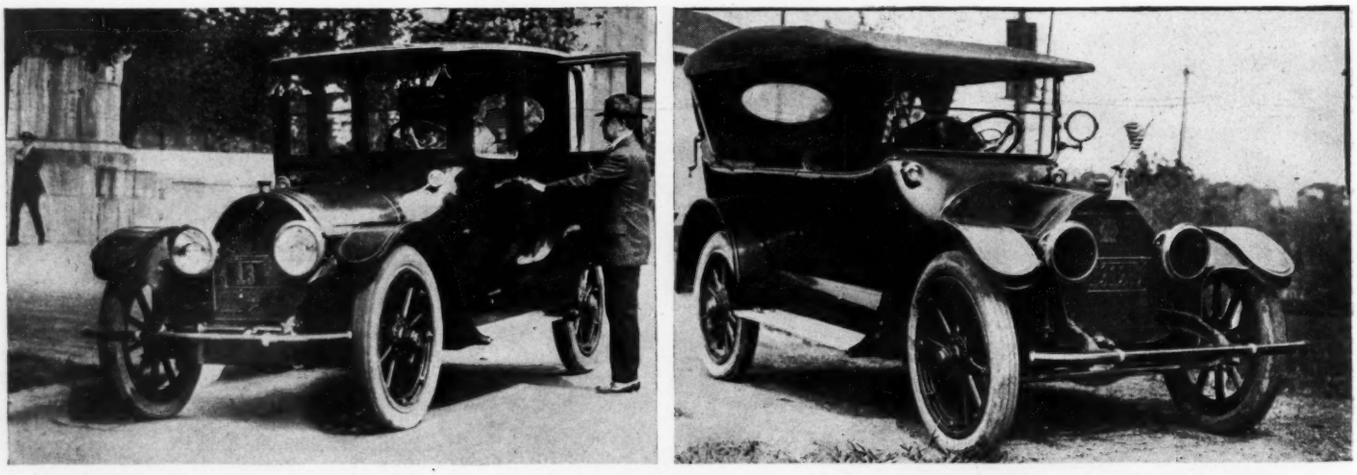
TEXAS SUNDAY SHY OF GAS

Austin, Tex., Sept. 8—The action of many dealers in gasoline and accessories in Texas in closing their establishments on Sunday has brought about a remarkable condition in touring on that day. It is now almost impossible for long trips to be made in any part of Texas on Sunday, as no gasoline for the exhausted tanks is obtainable.

Three knightly steeds in a row—their owners: Sam A. McCoy of West Virginia; E. W. Hughes of Tennessee and Arthur W. Clark of Portland, Maine



Dr. F. L. Osgood and——just count them and see for yourself how much luck he has through having the thirteenth car for his own in Vermont



So firmly does Col. Bert A. Boyd of Indiana believe in thirteen's luck, he has No. 13 and No. 1313

300,000 Cars in War

Entente Powers Work 170,000 and Central Belligerents Use 130,000

United States Motor Transports Are Additional

WASHINGTON, D. C., Sept. 7—Three hundred thousand motor cars to carry on the war! This number includes those being used by both sides but does not include motor transports which will be put in the field by the United States. The compilation has just been completed by the Japanese government, which has been investigating the number.

The principal Entente belligerents have about 170,000 motor cars, and the Central Powers have 130,000. The cars in use by the Entente powers are distributed as follows:

England, 30,000, including 15,000 for the conveyance of supplies; France, 80,000, including 25,000 for carrying supplies; Russia, 40,000, including 20,000 for carrying supplies; Italy, 10,000, including 5000 for carrying supplies; Belgium, 10,300; Roumania, 1700; and Serbia, 125.

The Central Powers are using their cars in the war as follows:

Germany, 100,000, including 25,000 for carrying supplies; Austria-Hungary, 30,000, including thirty for carrying supplies; Turkey, 750, including fifty for conveying good; and Bulgaria, 300.

ORGANIZE FOR U. S. TRUCK

Washington, D. C., Sept. 10—Christian Girl and J. G. Utz of the Standard Parts Co. have taken up permanent residence in Washington and will work on the organization necessary for the efficient manufacture of the standard military motor trucks. Mr. Girl and Mr. Utz at present are employed by the Quartermaster's Department at a salary of $1 a year.

This announcement may mean that the preliminary work is well along. Since it is expected that the standardized trucks will be in production before the end of the year, it is essential that the organization which will take care of the manufacture from the government end be commenced immediately. All methods of procedure, etc., will have to be decided well in advance, as manufacturers are getting ready for production.

TO REFINANCE CHALMERS

Detroit, Sept. 11—Special telegram—Maxwell is to continue manufacture of Chalmers cars and in its surplus factory space is to build Chalmers 3-ton trucks for commercial work in case the Maxwell company fails to receive government contract for Four-Wheel-Drive trucks, which it expects.

Stockholders of the Chalmers to-day ratified the refinancing plan recently announced and also lease of plant and assets to Maxwell for five years.

Under the new financing plan the capitalization of Chalmers will consist of $3,150,000 in 6 per cent five-year gold bonds secured by a first mortgage on its plant and assets, 44,000 shares of 8 per cent cumulative preferred stock of $100 per value and 400,000 shares of common stock of no par value. Of the $3,150,000 notes $2,779,000 are to be offered to present stockholders, including syndicate stock, each stockholder paying an assessment of $10 a share on present holdings, for example, an owner of 100 shares of present stock pays $1,000 for which he receives $1,050 in gold bonds and he gives up twenty-five shares of his present stock, for which he is given sixteen and two-thirds shares of the new preferred.

TEUTONS PREPARING FOR FUTURE

New York, Sept. 7—Both Germany and Austria are making preparations for developing their motor vehicle trade after the war is over. The leading firms will be in an excellent position financially to do so, for their profits during the period of the war have been very large. The dividends of the principal German firms have averaged from 20 per cent to 35 per cent. The Austrian Small Arms Co. has set aside 30,000,000 crowns for its war profits to start a factory for the manufacture of 10,000 standard cars per annum. These cars will sell at a low price.

F-W-D WILL TRAIN ARMY MEN

Milwaukee, Wis., Sept. 10—A training school for officers in the transportation division of the quartermaster's department of the United States Army, is to be established in connection with the big plant of the Four Wheel Drive Auto Co., at Clintonville, Wis., according to reports from that city. The company is filling an order for 3750 class B trucks, and it is said the plan contemplates the distribution of quartermaster officers in various departments of the plant as regular mechanics, who will move about to gain experience in every part of the work. Heads of the various departments are to give lectures and provide other intensive instruction relative to the construction, repair and maintenance of army trucks. The course, it is said, will require about eight weeks' time.

TIRE PRICE CHANGES

New York, Sept. 10—As was expected, an upward tendency in tire prices has followed last week's lead taken by six of the largest makers. Increases range from 5 to 10 per cent and tube prices remain stationary. A few of the prominent tires still remain unchanged in prices, such as Kelly-Springfield, Globe, Pennsylvania and Lee. On the other hand, Republic, Victor, Star, Peerless and Mohawk have gone up 10 per cent on pneumatics. Republic has raised its truck tire prices 15 per cent. The rise in prices on Star tires will occur Sept. 12.

Michelin advances 10 per cent Sept. 12. The Mason Tire & Rubber Co. has raised the prices of its tires and tubes 10 per cent.

No Increase in Grant Prices

Prices of Grant cars were not increased Aug. 1, as erroneously stated in Motor Age Aug. 9. The price remains at $875 for the touring and roadster models.

Accessory Show Assured

Exposition Will Open in Chicago Coliseum Sept. 22 for Week's Run

Ford Owners and Dealers Both Await Event

CHICAGO, Sept. 11—The much-discussed National Exposition for Ford Accessories will be held in the Coliseum here Sept. 22-29. The show is the conception of a proprietor of a magazine, whose circulation is among Ford dealers and owners, and others connected with this part of the motor field.

The officers of the exposition include J. E. Duffield, general manager and treasurer of the Bailey Non-Stall Differential Corp., and others of equally high standing. H. V. Buelow, the manager of the Toledo motor car show, is the manager of the exposition, and headquarters have been opened at the New Southern Hotel, Chicago. About 300 uniform spaces have been sold, and 250,000 tickets will be distributed free.

The main idea of the show is to furnish jobbers an opportunity to see several accessories at one time and decide what they want to catalog for next year, as previously they have had trouble in securing this information in time to get their catalogs out Jan. 1. Contrary to rumors which have been circulated, the goods to be shown at the exposition will be exhibited by the manufacturers' agents and not by the manufacturers themselves.

Although the exposition has not been endorsed by the National Association of Automobile Accessory Jobbers, some of the manufacturers in the association expect to exhibit, and while the Motor & Accessory Manufacturers have not sanctioned the exposition, the management of the show asserts that its exhibitors are those who would not be able to get space at the New York and Chicago shows, and this is their only chance to exhibit. So they are indifferent to whether they have the sanction of the M. & A. M. or not and equally indifferent to the fact that the National Automobile Chamber of Commerce has lined itself up with the M. & A. M. The backers of the show maintain they are legitimate manufacturers, that the show will benefit them, and that they have a right to hold a show if it does not bother anybody else. Much interest has been aroused locally in the show among Ford owners.

FORD POLICY CHANGING

Petoskey, Mich., Sept. 10—Under a new arrangement with the Ford Motor Co. the Northern Auto Co. of this city, which for several years has had the agency for the Ford for Charlevoix, Emmet and Cheboygan, has withdrawn all former sub-agencies and formed a partnership by which several branches will be operated in the territory, each branch to have under its direct supervision the sales of all Ford products including the passenger cars, trucks and tractors.

EDITORIAL PERSPECTIVES

Watch the Fuel Leaks

A VERY enlightening commentary on the tendency to a single idea is offered by observations of the writer on the attempts of two motorists to decrease their fuel consumption as a result of the present campaign for conservation of gasoline. In two different instances motorists had their carbureters carefully re-adjusted to give the minimum fuel consumption compatible with good operation but neglected to make sure that their fuel line was tight and are losing more gasoline every day by leakage than they could save in a fortnight through economical carbureter setting.

CONSERVATION of fuel in the motor car does not mean solely thinning the mixture down to the point where the engine can function properly. It also means seeing that all the gasoline that is purchased gets into the engine. You frequently see motorists waste as much gasoline in getting a little to clean a puncture as would run the car several miles. That is not conservation. That is needless waste—almost criminal waste. It is exactly the type of heedlessness that the U. S. Bureau of Mines, the N. A. C. C. and other agencies are warning the public against every day.

Aviation Mechanics

THERE have been some complaints on the part of men who rightly have prided themselves on their skill as motor car mechanics but have not been received with open arms upon their offer to serve in similar capacity in the government's aviation work. Probably this comes from sad experience on the part of those charged with filling the ranks of aviation mechanics. It has been found many times that many men who have proved themselves to be sufficiently skillful and careful for motor car work had to go through an extended course of training before they could be relied upon to take care of an aviation engine properly.

AVIATION work requires the highest class of workmanship. Take an example: Suppose there is a mechanic who classes himself as an expert autogenous welder. He does a sample welding job, and the weld is only 45 per cent as strong as the strength of the bar welded. That job will not pass. That welder is not good enough. The weld should be 90, 95 or perhaps 100 per cent of the strength of the bar welded. In the airplane poor welding jobs with only 40 per cent of the strength of the piece welded might cause the death of an aviator. It is not so serious with the motor car weld as with the airplane weld. Aviation requires expert workmanship, and many workmen who may imagine themselves expert in their jobs will find that their work is not up to the high standard needed for the aviation field. When the call for aviation mechanics comes it will be just as necessary to have the best men as it is necessary to have the best talent for the artillery service, the best men for the infantry or the best men for any arm of the service. If there are not enough of these they will have to be trained.

Cutting Out the Cut-out

ACTION of the National Automobile Chamber of Commerce in going on record as against the installation of a cut-out will mean that the steadily decreasing number of cars in which the muffler cut-out is stock equipment will be depleted materially in the 1918 cars. The N. A. C. C., which is a national organization of the motor car makers, has recorded itself as opposing the installation of a cut-out in such a way that it can be operated from the seat.

THE chief objection to the cut-out seems to be because many drivers make nuisances of themselves by indiscriminate use of it, and very stringent ordinances are enforced in most municipalities on that account. Many lovers of motors will view the passing of the cut-out with sorrow. They have felt that for country touring, particularly over unfrequented roads, the cut-out has a distinct usefulness, allowing the motor to do its work with the least effort and least over-heating. Also, they have found that the engine keeps cleaner, if it is used with no restriction of the exhaust to prevent quick discharge.

TO the ears of the ardent motorist the purr of the unmuffled exhaust over level roads or the staccato bark on climbing a hill is the most pleasing music. The audible response of the engine to every command of the driver, varying with every change in speed and grade of the road, develops a companionship between man and motor as close as that between the horseman and his steed.

MOTORING loses an intimate and oft-time useful adjunct in the abolition of the cut-out, but in all probability its usefulness has been over-rated and certainly there is no great logic in supplying to a car as stock equipment an accessory whose use is prohibited a large proportion of the time.

THE muffler cut-out has a distinct use in trouble finding, particularly in carburetion and ignition adjustments, because the direct exhaust to the air emphasizes any inequalities in the explosion and makes the location of the missing cylinder more simple than it could be otherwise.

MILITARY ROADS NEEDED

With between one and two million men going into training for the army in new cantonments, with new flying schools and officers' training stations operating at higher pressure every day, the need for roads which can be used all year round for trucking supplies from main centers to the military and naval posts throughout the country grows more desperate. What are we going to do about it?

—See Motor Age, next week—

Conservation of Man Power

Motor Vehicles Bring City Conveniences to Farm, Save Workers and Do More Business

With our expeditionary troops in France. This is an authentic photograph from the American army camp in France, showing a force of motorcyclists which forms a part of the motor vehicle division of the quartermaster's department

MOTOR cars are working many changes in the field of the salesman of home equipment and other lines which require that he have bulky samples with him. One of the instances of the use of motor cars in bringing city conveniences to the farm is in the distribution of home lighting plants. Manufacturers of the gasoline-electric plants for producing electric power in isolated homes have encouraged their salesmen in using a motor car to carry a sample system to the farm home for house-to-house canvass and demonstration.

In most of these arrangements, a sample system is set up permanently, either in the rear of a converted passenger car or in a special trailer, and demonstrations can be made at the prospect's home without removing the lighting set from the car.

The Dayton Electric Laboratories Co., maker of the Delco house lighting equipment, is encouraging its agents to install sets in the rear end of passenger cars, so that the agent can take the outfit direct to the home of the prospect and demonstrate to him there. Other concerns are encouraging similar methods on the part of their dealers.

The Kansas City branch of the Western Electric Co., for instance, is sending out thirty sales agents of its farm lighting department, with trailers attached to motor cars, to carry the message of mechanical power to farmers and their wives. These agents cover Kansas, Oklahoma and Western Missouri. Heretofore, the salesmen generally have been covering their territory by a motor car with a very small equipment at the back. The trailer permits carrying larger equipment, more in keeping with the needs of the greater proportion of the prospects.

One of the advantages of the trailer is that it can be left at a farmhouse part of the day or all night so that the prospect can run the outfit for himself. A particularly useful feature of the trailer which has been developed and is proving very successful, in arousing popular interest, is its facility for demonstrating at community gatherings. A trailer can be left to furnish the light for the meeting, the agent getting the names of prospects from among those who are enjoying the services of the equipment.

Aside from the very great sales value in taking the sample directly to the home of the prospect, a feature which would be almost impossible without the motor car with goods similar to these house lighting outfits, there is a very great saving in the number of men required to cover the territory, because with the motor car, the salesmen can go from town to town without the delays incidental to railroad travel, and in this particular line the motor car is almost indispensable if the salesman is to visit the prospect at his home. It is reported that the saving in time in simply getting from one town to another as compared with railroad travel averages from 60 to 75 per cent. In other words the salesman can visit from three to four times as many towns in a week and cover the surrounding territories more thoroughly than is possible in any other way. In many similar lines the results the the same.

CASTINGS HAVE DELAYED HARROUN—IS SOLVENT

Detroit, Sept. 11—Special telegram—John Guy Monihan, president Harroun Motors Co., in a statement to stockholders next week will say the company is not only solvent but could liquidate at once and pay every cent invested. A castings company which was making castings for Harroun and held Harroun patterns went bankrupt sixty days ago, and Harroun, being unable to acquire patterns, was unable to make deliveries. Since then the patterns have been turned over to the Marshall Casting Co.

The company shipped eighteen cars last week, will ship over thirty cars this week. The statement shows plant to be worth $1,200,000 with a capacity of eighty cars a day single shift and 150 cars a day double shift, which can be increased by additional buildings to 300 a day.

The company expects to turn out 24,000 cars first year, following steadying of materials markets and 50,000 cars the second year. It has contracts from distributors with $15,000,000 for first year, and all distributors' contracts range over a five-year period with eighty-five chief distributors in the United States and Canada. Materials on hand in quantities are enough for 18,000 cars but sheet metal and castings are short, which delays production delivery.

Muffler Cut-Outs to Go

N. A. C. C. Decides to Eliminate Them on Their Cars in Future

Directors Perfect Plans to Further Gasoline Saving

NEW YORK, Sept. 7—As the use of muffler cut-outs is becoming a nuisance, the members of the National Automobile Chamber of Commerce have voted unanimously to eliminate them on the cars they build in the future, so far as they can be operated from the driver's seat. Almost half of the 110 makers in the chamber do not fit muffler cut-outs to their present cars. The new resolution will go into effect Jan. 1.

The directors elected Hugh Chalmers, president of the Chalmers Motor Co., first vice-president of the N. A. C. C., to succeed Wilfred C. Leland, who leaves motor car making to enter the aeronautical industry as one of the owners of the Lincoln Motor Co. of Detroit. H. H. Rice, treasurer of the General Motors Co., was elected vice-president of the gasoline division, the office formerly held by Mr. Chalmers.

The directors endorsed the Webb-Pomerene bill now before the Senate, which would encourage combinations of American makers and exporters to promote American trade abroad. The export committee feels that operating under this measure would help materially in getting the world's trade for motor car makers.

The directors perfected plans for a "don't waste gasoline" campaign in cooperation with the authorities at Washington. The campaign is to be carried on vigorously, even to the extent of encouraging city ordinances to make unlawful the idle running of engines when cars are at a standstill, a practice which consumes much gasoline every year.

The Elgin Motor Car Co., Chicago, has been elected to membership in the National Automobile Chamber of Commerce.

TYPOGRAPHICAL ERROR

An error in proof-reading in the last paragraph of an item in the issue for Aug. 30 made it read as though the Chandler company were concerned in a deal with Maxwell. As the item was headed "Maxwell-Chalmers Lease" and two paragraphs in regard to the Maxwell-Chalmers lease preceded the paragraph in which the Chandler's name appeared, it should be evident to our readers that Chalmers was meant throughout.

HANES TIRES IN PRODUCTION

Winston-Salem, N. C., Sept. 7—The Hanes Rubber Co., a concern organized two years ago, has completed its factory here and is now in production, the first tire having been turned out last month. The Hanes is making plain tread, a Ground Gripper non-skid and red and gray tubes. A cord tire will be added to the line shortly. The establishment of a plant at Winston-Salem represents the first effort on a large scale to establish tire manufacturing in the South, which many regard as a favorable location, because of the proximity to the cotton fabric district. The Hanes Rubber Co. has a capital stock of $500,000, which is held by two men, A. S. Hanes, for eleven years head of the Hanes Hosiery Mills, and John W. Hanes, formerly with the American Tobacco Co. and the DeLion Tire Co. of Trenton. Chris Miller, who has been with Dunlop, Michelin and Continental in Europe, is general factory manager, and production is active.

TO AUCTION CHICAGO CONCERN

Chicago, Sept. 10—The entire stock of the Service Motor Supply Co., Chicago, which was declared bankrupt some time ago, is to be auctioned off Sept. 27 by Samuel L. Winternitz Co. The inventory value is over $250,000.

MORELAND TO MAKE TRACTORS

Burbank, Cal., Sept. 8—The Moreland Truck Co. is experimenting with two types of tractors, which the company plans to manufacture on a large scale soon and will commence production on as soon as its million-dollar plant in this city is completed. One tractor will be of 30 hp. and the other of 75 hp.

MARKET AWAITS FORD TRACTORS

Detroit, Sept. 8—Henry Ford & Son will be unable to place the Ford tractor on the open market for some time, according to Henry Ford, because of large contracts the company has with the English government. Mr. Ford has promised to send the first tractor made to Luther Burbank in California.

ASKS RECEIVER FOR GILLETTE

Indianapolis, Ind., Sept. 8—Stockholders of the Gillette Motor Company of Mishawaka, Ind., have filed suit seeking the appointment of a receiver for the company. The plaintiffs allege that the company has failed to fulfill its contracts and that the manufacture of the Wilmo motor has not been carried out, as was originally intended. It is alleged furthermore that the company is insolvent; that it has failed to pay its obligations; that its assets are not sufficient to pay its debts and that the funds of the company have been misappropriated. King C. Gillette, razor manufacturer, founded the company, which is incorporated under the laws of West Virginia.

THIRD SERIES PACKARD OUT

Detroit, Sept. 10—The Packard Motor Car Co. has brought out its third series line of Packard twin-sixes with ten styles of enclosed cars. All types of these, except a coupe and the new six-passenger brougham, may be had in two lengths of wheelbase. The line includes limousine, imperial limousine, landaulet, coupe, brougham for seven passengers with no partition and individual front seats with an isle between, brougham for six passengers with the top lower than on the other inclosed cars and with a straight-line roof effect.

Howard Marmon Returns

Air Commissioner and Vincent to Work Together for U. S. Aviation

Government Wants Men for Air War Service

WASHINGTON, D. C., Sept. 7—Captain Howard Marmon, who returned Saturday from his trip to England, France and Italy, where he went to visit all the aviation factories and study the problems of aviation, has taken up his office in the Bureau of Standards, where he will carry on the work done by Jesse G. Vincent. Mr. Vincent will continue his work at the testing fields, where he will observe the performance of engines and work with Captain Marmon. Marmon is particularly impressed with the U. S. aviation engine which has been developed in Washington and which does not contain any radical features of design but which has incorporated in it the best aviation engineering practice of all the warring nations.

He thinks it practically a marvel that this engine should have been developed and tested out in such a short time. The work has been done under Mr. Vincent. Compared with the European engines it is an excellent product. Capt. Marmon feels that Italy is the leader in aviation, notwithstanding the great progress that has been made by France and England. Italy's problem has been that of building machines to scale the mountain tops and carry large tonnage of bombs, a problem which is greater than that having to be faced by the other Allies. When Mr. Marmon sailed for Europe several men from different factories went with him, the majority of whom are still abroad to execute his orders.

Government Schools

Government activities in aviation schools continue at white heat. A flying school will be established at Fort Worth, Tex., and British instructors will assist American officers prepare Americans for air service on the western front. American students already are under training in the Royal Flying School at Toronto, Canada. The school is to be moved to Fort Worth about Nov. 1 to avoid the cold of Canada. Construction work is to start on two aviation schools there soon. Four squadrons, 600 men, probably will be under training in the new school when complete. Some will be mechanics to keep the planes and engines in condition.

The government now is seeking application from reserve corps officers who have finished the special courses at Fort Monroe, Va., or Fort Sill, Okla., and from enlisted men or civilians who are expert photographers, radio operators or machine-gun operators for service in the aviation section. Such men would be candidates for commissions as observers from airplanes. They will be assigned to a school for two months' instruction in study of fire from airplanes, reconnaisance, photography, radio and bomb dropping.

So immediate is the need for airplane workers the government has issued an executive order to waive civil service rules as regards this class of experts.

Even now a group of Italian aviators are augmenting the British, Canadian and French aviators already in this country to assist in the promotion of the United States program of aviation. The Italians are here to teach American aviators how to fly and to do everything else in their power to pass on their experience, training and knowledge. Captain Tappi Carlo is at the head of the group. The highest honors recently were bestowed on him for his many daring flights in service on the fighting front. With him are six other officers, all experienced flyers. They expect to be assigned to the various flying stations here by the authorities at Washington.

PERMANENT LINK FOR N. O. T.

Indianapolis, Sept. 10—Marion County, Indiana, will dedicate the first permanent link in the National Old Trails road Sept. 15 with a parade and suitable ceremonies, followed by an inspection of the 60-mile system of hard roads in the county. Guests from Indiana, Illinois, Ohio, Kentucky and Michigan will be entertained, and Governor Cox of Ohio, Governor Goodrich of Indiana and Governor Lowden of Illinois will represent their states at the dedication. The county commissioners have the ceremonies in charge.

CONTINENTAL GETS WAR ORDERS

Detroit, Sept. 10—The Continental Motors Corp. has orders for thousands of engines for ambulances and trucks for the medical, signal and aviation divisions of the army.

The company had net earnings of 10 per cent on the common stock after deducting the sinking fund requirements and preferred dividends, and on this showing will earn $2,000,000 for the year.

Roads Get Millions

Apportionment Divides $14,550,000 Federal Aid Money Among States

Texas Gets Largest Amount, With New York Next

WASHINGTON, D. C., Sept. 8—A total apportionment of $14,550,000 to the several states has been made by the Secretary of Agriculture out of federal road funds, to be used in the construction and maintenance of highways, the money to be expended during the fiscal year ending June 30, 1919.

This is the third apportionment made to the states under the Federal Aid to Good Roads Act. Texas gets the largest apportionment, $876,986.70; New York state gets $749,674.20, and Pennsylvania comes next with $690,145.78, and Illinois with $658,323.48.

The apportionments in detail follow:

State	Sum
Alabama	$ 313,456.47
Arizona	205,540.58
Arkansas	250,018.47
California	456,167.23
Colorado	257,278.92
Connecticut	92,216.45
Delaware	24,411.99
Florida	170,723.88
Georgia	403,909.45
Massachusetts	221,261.85
Michigan	435,356.37
Minnesota	425,865.40
Mississippi	268,751.60
Missouri	508,603.98
Montana	293,520.89
Nebraska	319,445.25
Nevada	193,229.82
New Hampshire	62,610.11
New Jersey	177,357.22
New Mexico	238,634.55
New York	749,674.20
North Carolina	342,556.47
North Dakota	229,585.91
Ohio	558,043.42
Oklahoma	346,489.34
Oregon	236,332.74
Pennsylvania	690,145.78
Idaho	182,471.55
Illinois	658,323.48
Indiana	406,230.18
Iowa	434,653.61
Kansas	429,131.88
Kentucky	292,984.62
Louisiana	203,755.29
Maine	144,807.42
Maryland	130,871.43
Rhode Island	34,972.38
South Carolina	215,014.08
South Dakota	243,175.61
Tennessee	340,663.51
Texas	876,986.70
Utah	170,763.17
Vermont	68,128.92
Virginia	298,120.77
Washington	216,530.19
West Virginia	159,713.89
Wisconsin	382,707.20
Wyoming	183,805.78
Total	$14,550,000.00

In the other apportionments $4,850,000 was apportioned for the fiscal year ending June 30, 1917, and $9,700,000 for the fiscal year ending June 30, 1918.

TANKS FOR U. S. TROOPS

Washington, D. C., Sept. 7—Publication of recent hearings before the appropriation committee of the House on the urgent deficiency bill shows that the War Department contemplates the manufacture and use of tanks in the European war. An item of $21,750,000 in the bill appears under the title of an appropriation for armored cars, but Gen. Crozier told the committee this is intended to buy tanks.

The tanks, to be manufactured in the United States, will carry a light 3-in. gun of the howitzer type and will be designed to carry eight or ten men each. It is estimated that 2000 or 3000 tanks can be made with the appropriation.

MUNGER SUES FIRESTONE

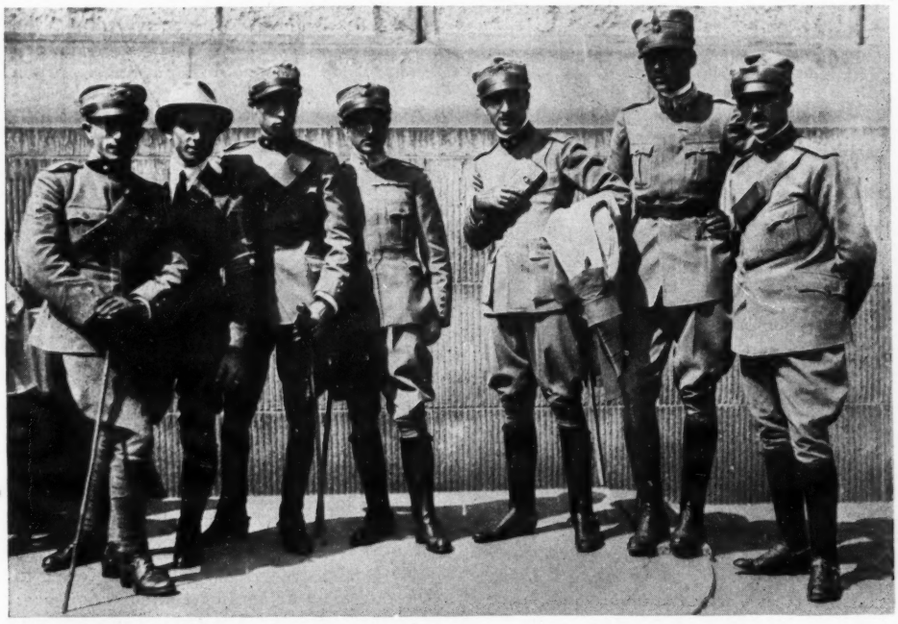
New York, Sept. 8—Louis deF. Munger has brought suit against the Firestone Tire & Rubber Co. for back royalties amounting to $1,500,000, claiming damages through having been unable to dispose of his patents on account of the Firestone rim. The suit has been entered in the United States District Court and is the first to be brought as a result of the court's decision against the Perlman Rim Corp. last June in Munger's claim of infringement on his patent No. 638,588 of Dec. 5, 1899, covering a tapered rim fitting into a tapered felly.

ARMY TRUCKS TREK FAR

Fort Sam Houston, Tex., Sept. 8—An army motor truck train consisting of thirty vehicles left here several days ago and made the trip without accident to Fort Sill, Okla. The distance was 438 miles. It is stated that no effort was made to establish a record run on this trip and that it was taken simply as a matter of convenience. The roads for the most part were found to be in good shape and the men and the trucks stood the trip splendidly. It is becoming a common practice in the Southern Department for army motor truck trains to travel from one camp or post to another at distances ranging from 100 to 300 miles.

PAIGE NEW CLOSED CARS

Detroit, Sept. 8—The new Paige closed cars which were exhibited in Detroit this week are refined and improved products compared with the previous line. They are the first output of the new inclosed car department with an original decorative scheme.



The Italian aviation officers who will help train American airmen. Fourth from the left is Captain Carlo, chief of aviation of the Italian army

One of the features of the decorations is the use of colors to produce harmonious effects for the seats, side, top and carpeting. One of the standard colors is Kentucky rose with different designs in the weave for different parts of the interior.

The prices of the inclosed cars are $3,230 for the limousine and town car; $2,850 for the convertible sedan and coupe; and $1,775 for the seven-passenger touring essex.

All these cars have been refined from a structural standpoint to prevent rattles, and they have improved windshields designed to prevent any possibility of the entrance of rain. The exterior colors are offered in two options, brown and blue.

200 TRUCKS FOR AVIATORS

Washington, D. C., Sept. 11—Special telegram—Twelve hundred Kelly-Springfield motor trucks have been purchased by the aviation section of the Signal Corps. The trucks are to be used at the aviation training camps and probably these and trucks in much greater quantities will be used abroad when American aviators are in numbers on the Western front.

G. M. AUGUST SALES

New York, Sept. 11—Special telegram—General Motors sales during August totaled 18,117 cars and trucks, compared with 11,717 cars in Aug., 1916. Buick was first with 10,874, compared with 8,461; Oldsmobile second with 2773, compared with 786; Oakland third with 2668 against 2133; Cadillac fourth with 733 against 99. General Motors Truck Co. shows 400 per cent gain in August sales, totaling 1069.

SAXON YEAR NETS $663,768

New York, Sept. 8—The Saxon Motor Car Corp. for the fiscal year ending June 30, 1917, earned a net income of $663,768, compared with $1,316,273 for the preceding period. This was after crediting use and occupancy insurance, charging all extraordinary operating expenses occasioned by fire and deducting $100,000 as reserve for contingencies. It is equivalent to $11.06 a share earned on $6,000,000 capital stock, against $21.93 a share earned the previous year. During the fiscal period the company paid a bonus amounting to $60,371 and dividends on the stock totaling $315,000.

October Chicago Races

Gloom of Enthusiasts Lifts as Speedways Plan to Prolong the Season

Harkness Trophy and Providence This Month

CHICAGO, Sept. 10—Following the abandonment of last Saturday's race at the Chicago speedway, plans are announced for a meet on the Maywood track either Oct. 6 or Oct. 13, the date depending on which will conflict least with the possible world series baseball games.

The gloom that has enshrouded motor racing enthusiasts for the last three weeks seems to be lightening slightly with the announcement of new plans of some of the larger speedways, so that there is hope that the season may not come to an untimely demise as seemed to be the prophecy a week or so ago. Not only have the arrangements for the $10,000 Harkness trophy of 100 miles at the Sheepshead Bay track Sept. 22 progressed favorably, but there is lively interest in the Providence, R. I., races next Saturday. Now it is announced that Chicago will come back with a meet in October. The headliners that are expected for all of these include Ralph de Palma, Barney Oldfield, Ralph Mulford, Louis Chevrolet and Ira Vail.

CHEVROLET-DE PALMA DUEL OFF

Chicago, Sept. 8—The motor race meet which was planned for the Chicago speedway to-day was called off last night definitely after several announcements of a contradictory nature. The local newspapers this morning stated the abandonment of the race was due to de Palma, who was to have been the star attraction, being called to Washington into government service as inspector of aviation engines. This does not seem to be true, so far as can be learned. It appears to have been the dream of an over-enthusiastic press agent. The real reason for de Palma's withdrawal seems to be that the owners of the Packard which has been campaigned by de Palma have called it in for preparation for trials on the Sheepshead Bay speedway later.

The contest which suffered this last minute abandonment has been on the cards only a week. It was hastily arranged last Saturday, after the meet on the Chicago track in which de Palma and Chevrolet shared honors.

The rapid-fire series of events which caused the motor columns of the daily papers to reverse themselves every day, were in somewhat the following order:

De Palma challenged Louis Chevrolet—Race on!

De Palma's Packard called in by factory—Race off!

Chevrolet offers de Palma choice of the two Frontenacs, Chevrolet to drive the other—Race on!

Field increased to include Ralph Mulford in a third Frontenac, Dave Lewis with a Hoskins Special, Tom Alley with a Pan-American and Gaston Chevrolet—Race still on!

Mulford starts for Chicago—Race still on! The weatherman prophesies rain—Race off!

ELLIOTT WINS AT UNIONTOWN

Uniontown, Pa., Sept. 8—Frank Elliott, a protege of Barney Oldfield, and driving the veteran's old Delage, snatched victory from Joe Boyer in the Army and Navy sweepstakes, 112½-mile race at the Uniontown speedway Labor Day, when Boyer was forced to the pits in the eighty-second lap with engine trouble to his Frontenac. Previous to that time Boyer had driven a steady, consistent race and was well in the lead when forced to retire.

Elliott's time was 1:14:26.96, or an average speed of 90 m.p.h. Barney Oldfield started out like a world beater in his Golden Egg. He lasted nine laps. A blown tire caused the car to turn completely around on the southwest curve. The stern was battered somewhat, and Oldfield retired from the race. Threatening weather caused the scheduled 112½-mile dealers' event to be drawn at the end of fifty laps, or 56 miles. I. P. Fetterman in his undefeated Peerless won the event in 39:34.85. Fifteen cars entered the race, but times were taken of but six. Three were called in, and the remainder dropped out during the contest. Twenty thousand people attended the races.

Sweepstakes Race

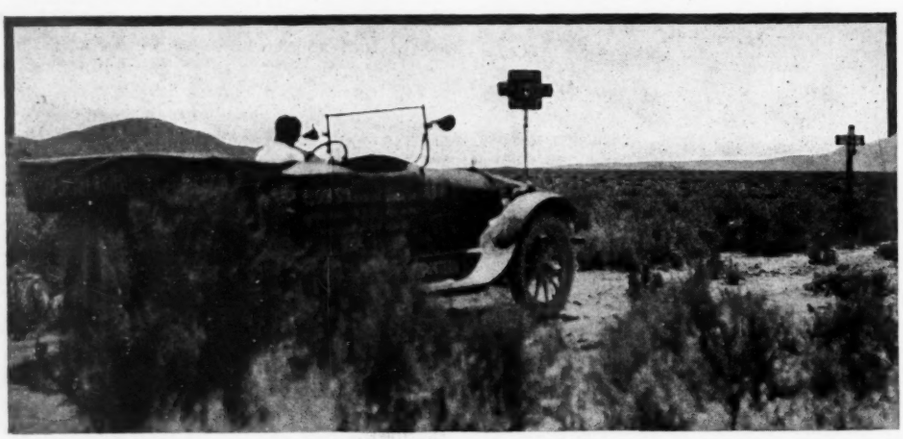
Frank Elliott, DeLage—1:14:25.96
Jimmy Meyer, Pugh—1:15:38.49.
Andy Burt, Erbs—1:20:14.20.
Ora Haibe, Palc—1:22:28.20.
C. M. Ewan, Crawford—1:28:49.20.
Wilmer Monahan, Johnson—1:30:21.25.

Dealers' Race

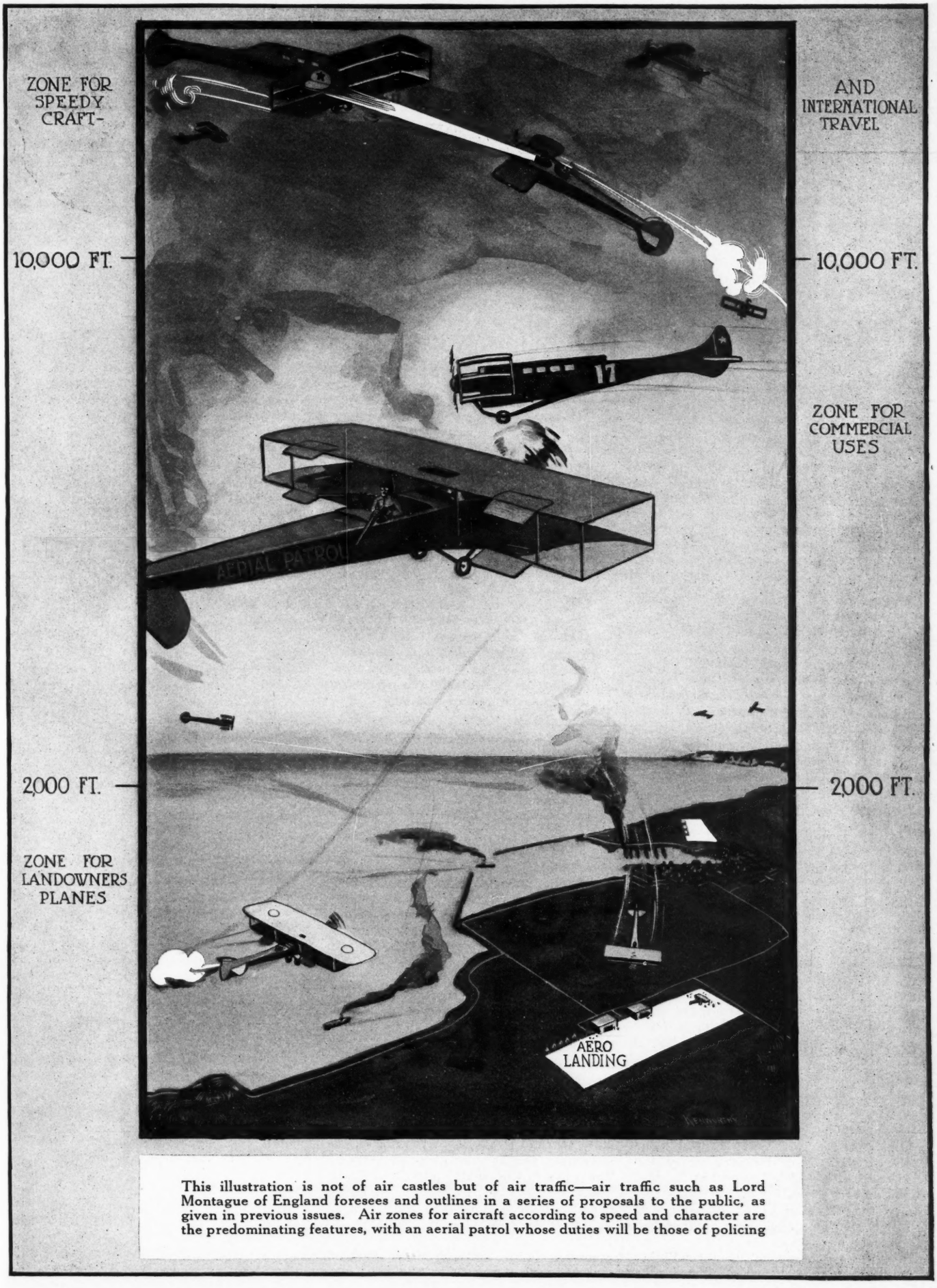
I. P. Fetterman, Peerless—39:24.85.
Bobbie Shoff, Haynes.
Jack Conway, Hudson.
Nat Fetterman, Haynes.

FEDERAL SUCCEEDS TOM THUMB

St. Paul, Minn., Sept. 7—The Tom Thumb Tractor Co., maker of the Tom Thumb tractor, has been reorganized as the Federal Tractor Co. The company will continue to make the Tom Thumb, though the name probably will be changed later to Federal. The officers of the company are: President, H. W. Brown; vice-president, J. N. Kirby; secretary and treasurer, A. A. Robbins.

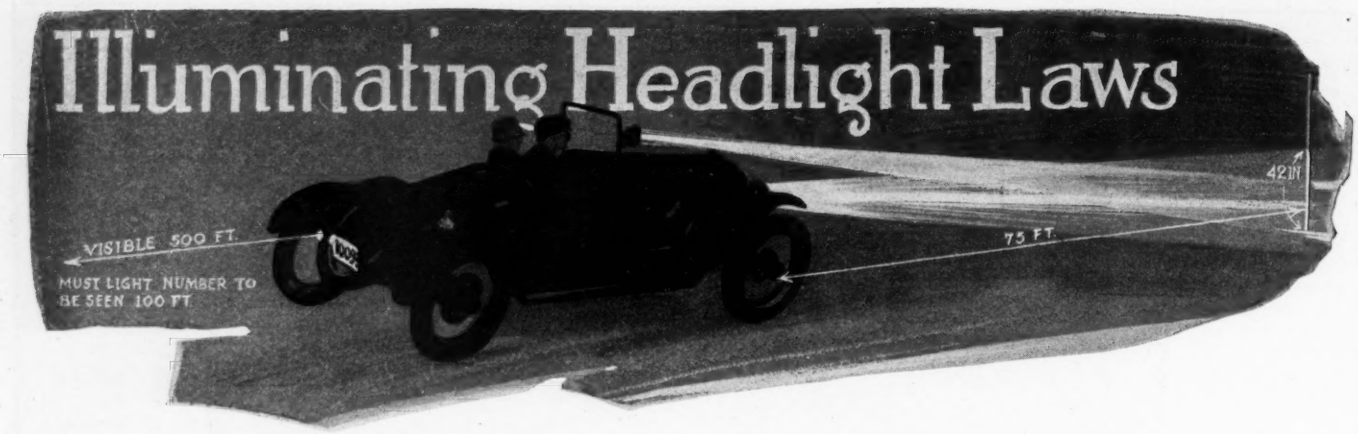


The Elgin Six scout car "somewhere in the West." Aug. 24 the car reached San Francisco after a transcontinental run to gather road data, which started Aug. 4



This illustration is not of air castles but of air traffic—air traffic such as Lord Montague of England foresees and outlines in a series of proposals to the public, as given in previous issues. Air zones for aircraft according to speed and character are the predominating features, with an aerial patrol whose duties will be those of policing

Illuminating Headlight Laws



THOSE who would regulate motor car headlights are much like the several politicians who seek the same office. A study of the work of legislators of nearly all states shows that, while they all have tried to accomplish the same result—that of preventing the temporary blinding of an approaching driver or pedestrian by the brilliant light—they have framed laws in such specific and conflicting terms as to make it practically impossible for any car manufacturer to comply with them without adopting some one of several patented dimming devices that have been approved by the commissioner of motor vehicles or the highway commission of the various states.

Makers of motor cars are much confused by the differences in the headlight laws as enacted by the various state legislatures. They desire to put their cars out so that the stock lighting equipment will comply with the laws in each state. Quite recently manufacturers requested the National Automobile Chamber of Commerce to digest the regulations relating to headlights in force or to become effective next January so that they might be guided as to the necessary equipment to meet all requirements.

Uniformity a Great Need

Perusal of this digest emphasizes the great need for uniformity of motor vehicle laws and the desirability of having present state laws superseded by a national act providing for the registration and regulation of the operation and equipment of motor vehicles.

Fifteen states require that the beam of reflected light from the front lamps shall not rise more than 42 in. above the level surface of the road on which the vehicle stands, unless the lamps are fitted with lenses or dimming devices to diffuse the rays or lessen the intensity of the lights. These are:

California, Connecticut, Florida, Iowa, Nebraska, New York, Nevada, North Carolina, North Dakota, Ohio, Oregon, Texas, Utah, Vermont and Washington.

Michigan requires that headlights be equipped with some device whereby the light can be dimmed or lessened at the will of the driver. New Hampshire makes necessary the dimming or extinguishing of headlights when approaching another motor vehicle, or a street car.

New Jersey cars must have headlights fitted with approved lenses, dimmers or other devices of like nature. There already are more than forty such patented devices.

The department of motor vehicles in Connecticut has approved some fifteen different diffusion or dimming devices and after Jan. 1, 1918 all the cars used in New Hampshire must be equipped with electric headlights equipped with some device approved by the commissioner of motor vehicles. Rhode Island has authorized the state board of public roads to prepare rules governing the lighting of motor vehicles. These are in the making now.

Dimming devices, however, must not reduce the volume of light so much that the lights will not be plainly visible at distances varying from 200 to 500 ft. ahead—according to the state in which used—or will not reveal objects on the road from 150 to 250 ft. ahead. Most states require white lights in front, but New York and a number of other states permit the use of amber or other colored lenses or glass.

Indiana imposes a law regulating tail lights which makes it plain that this light must be independent of any other light and it must not be possible to extinguish it while the car is in motion.

Spotlights, perhaps, are under more strict regulation than any other lamp. In Wyoming, for example, the spotlight can be used only in emergency when rounding curves; in Delaware it must be on the left side of the car with its rays directed over the hood to the right side and must be used only for reading signs and numbers or directed upon the road at a distance of not move than 30 ft. ahead of the lamp.

From an analysis of the laws now effective it appears that to conform strictly with the statutes in all states, it will not suffice for the manufacturer to equip his cars with headlights that can be tilted down, or fitted with lenses that diffuse or deflect the rays, but he must fit a dimmer that can be operated by the driver and such dimmer must be of a make or type approved by the commissioner of motor vehicles in some states and the highway commissioners in others.

It may be safe to assume that any construction, treatment, or equipment of the lamps that will prevent throwing a dazzling beam of light more than 42 in. above the surface of the road 75 ft. ahead of the car, yet which will not prevent them being visible 500 ft. ahead or giving sufficient white light 250 ft. ahead and 10 ft. to each side of the road 10 ft. ahead of the car will conform with the spirit of the law in every state.

To Conform with General Laws Your Headlights Should Be—

SET so the concentrated beam of light does not rise more than 42 in. above the ground 75 ft. ahead of the car when the car is standing on level ground

Visible at least 500 ft. ahead of the car.

Strong enough to reveal objects in the road 250 ft. ahead of the car and 10 ft. to either side of the road, 10 ft. ahead of the car.

Equipped with lights that do not exceed 21 candlepower and if more than 4 candlepower bulbs are equipped with a reflector, fit the light with some efficient, practical and permanent device whereby the rays can be dimmer or lessened at will.

Spotlights

Spotlights should conform with the foregoing as to candlepower deflection, or dimming or scattering of rays and the light should be attached to the left side of the car.

Tail Lights

Tail lamps should show a red light visible under normal atmospheric conditions 500 ft. to the rear and throw a light on the number plate sufficient to render the numerals visible at a distance of 100 ft.

WISCONSIN RAISES FEES

Milwaukee, Wis., Sept. 10—An increase of 100 per cent or more in the cost of motor registry in Wisconsin will become effective Jan. 1, 1918, at which time private owners will be required to pay $10 for an annual license instead of $5, as during the last eight year. Dealers will pay $25 instead of $10 for an annual license, and motorcyclists will pay $4 instead of $2. The license system also has been changed so that motor trucks, formerly classed with the cars of private owners, will be required to pay in fees is effected through the general a graduated scale of fees based on advertised load-carrying capacity. The changes

modification of the Wisconsin state-aid highway act.

Heretofore Wisconsin dealers were obliged to pay an annual fee of $10, and thus were entitled to four pairs of star number plates to distinguish dealers' from private owners' cars. Under the new law, dealers will be required to pay $25 a year and will receive eight pairs of license plates.

Fees for motor trucks are as follows: If the advertised load-carrying capacity is less than 2100 lb., $15 per annum; if 2100 lb. or more and less than 5100 lb., $20 per annum; if in excess of 5100 lb., $25 per annum. It is provided, however, that if the owner of any motor truck, motor delivery wagon or passenger motor bus accompanies his application for registration with an affidavit that said vehicle will be used entirely for the transportation of persons or goods within the limits of an incorporated city or village, the fee shall be only $10 and the registration number plates shall be of the same number series and character as those furnished for ordinary cars belonging to private owners. The idea is to make the owners of trucks using the country highways of the state pay more than those whose cars are used entirely upon streets and roads maintained by cities and villages at their own expense.

NEW CALIFORNIA CODE

Every motor headlight in California was practically condemned recently until it could be inspected and approved by police authorities. Under penalty of a heavy fine for using unapproved lights, the quandary of the motorists can well be imagined.

The new state motor code, which just went into effect in California, demands that headlights on all motor vehicles be permanently adjusted so that their shaft of light will not project more than 42 in. above the ground at a distance of 75 ft. or more in front of the vehicle. All lamps must be adjusted and tested under the supervision of the police department which then approves the test and issues adjustment certificates.

As it was necessary for every motorist in Los Angeles to have his headlights adjusted and certified, and within a very short time before the law went into force, the need for central adjusting stations became evident.

The Prest-O-Lite branch had just recently moved into its new building—large, commodious quarters built for service—why shouldn't it serve as an adjusting station?

No sooner had the idea occurred to the Prest-O-Lite manager than he announced to Los Angeles motorists that the Prest-O-Lite battery service station would adjust and test headlights free of charge. A force of adjusters was arranged for, police officers were on hand to issue certificates and systematic adjusting began.

Two continuous lines of motor cars poured through the double doored entrance, drew up to a 75-ft. line, had their lights adjusted and certified, and left by the exit on another street. From 7:30 to midnight, the first night, more than 200 pairs of headlights were adjusted. The second night the waiting line was nine blocks long, the third night, twelve blocks long.

What Stops the Glare

Dayton, Wash., Reader Gives His Version of the Problem

Outlines What Action Reflector Has on Rays

DAYTON, Wash.—Editor MOTOR AGE—It would seem that, after so much has been written concerning the stopping of glare from motor car headlights, that the principles ought to be fairly well understood. However, I find it amusing to read some of the articles published purporting to explain the matter. The perfect parabolic reflector, with a single point of light placed at the focal point of the reflector, will send all reflected rays in a perfectly parallel stream directly forward. This must be remembered when trying to focus a lamp in the reflector. If the lamp is outside of the focal point all reflected rays will be bent inward in the beam of light, and may cross at some point ahead of the lamp, to be spread out again farther on. This must be remembered when trying to overcome glare as the light from the lower portion of the lamp under such circumstances will blind the eyes of those coming toward it. Hence, under these conditions the lower portion must be covered to avoid glare where a shield is to be used.

However, if the lamp is inside the focal point, the rays will be spread out instead of converging, and then the rays from the lower half of the reflector will be directed downward to the ground, and those which impinge upon the upper portion will be sent upward and blind passersby. Under such circumstances the upper portion must be covered with a hood or some diffusing device in order to overcome the glare.

If these principles are remembered everyone can set his lamp so that he will get the best results no matter what device is used. There is only one right setting for the lamp, and that is as near the focal point of the reflector as possible. Then all rays except those which are direct, will be sent forward in a practically solid beam of light. It has always seemed foolish to me to strive for a good strong light for country driving, which is absolutely necessary, and then destroy a part of the light by any means which decreases the light. Ground glass, shields of any kind, or any means for dispersion of the light after it has been concentrated, seem out of place, but prisms which bend the rays downward so they do not rise above 42 in. from the ground seem the logical way of overcoming the difficulty. This might be done also by bending the lamp forks so that the same result is obtained, but remember that the focusing of the lamp is the most important of all.

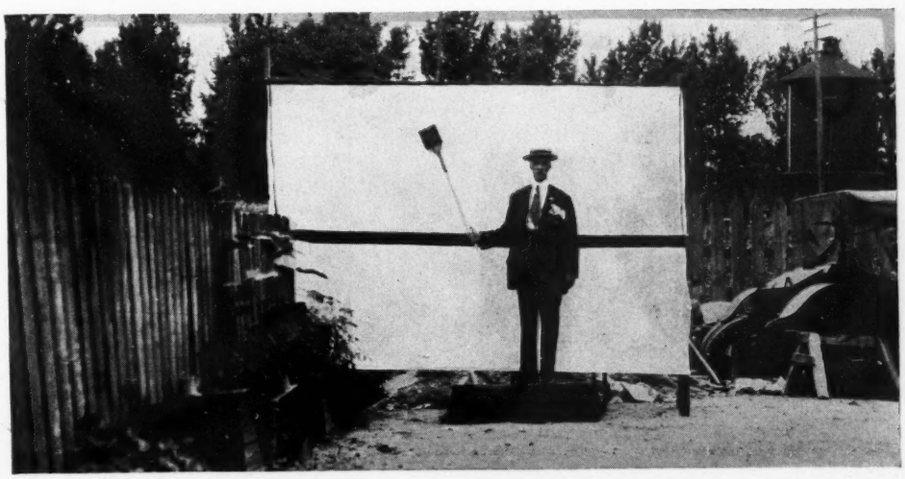
Simple Device for Testing Headlights

Maryland Officer's Apparatus Shows Proper Adjustment

FOR the testing of headlights under the new state law of Maryland, a unique but simple device has been made by Captain Noah Walker, of the Arlington, Md., police station.

The device consists of a piece of green glass, 5 by 5 in. set in a handle. The lights to be tested are placed 75 ft. away from a large white square as shown in the cut. This square is made of white oilcloth placed on a frame. Across the frame 40 in. from the bottom is placed a piece of black cloth 4 in. wide.

The lights of the car are focused on the white screen and the green glass is held on the upper part of the frame over the black line. If the rays of light strike the glass it will show green and if the rays do not strike, it will show black. If the glass shows green it is prima facie evidence that the rays of the lights are being thrown too high and the law is being broken. Many motorists are availing themselves of the new tester to see if their lights are properly adjusted. The device is simple but seems to offer an effective test.



Headlight testing device made by Arlington, Md., police officer

The Cove on the Ridge road, a relatively large area of fine valley land entirely surrounded by mountains largely covered with virgin forests. The lowest point in the picture is at least 2500 ft. above sea level

Maryland's Wonderful Ridge Road

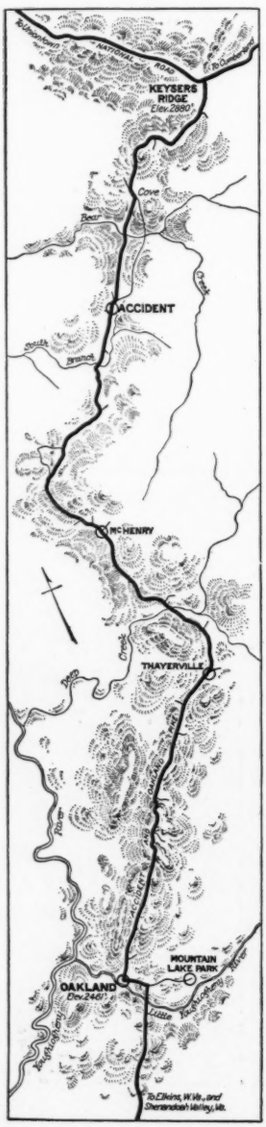
By Robert Bruce

THE week we spent motoring through the little known and partially explored highlands of central and northern West Virginia was literally crowded with scenic interest, but the lack of improved roads for the greater part of the way and the meager hotel accommodations at some places had taken much of the expected pleasure out of it. So by the time we turned away from the picturesque Cheat river, a short distance above its head at Parsons, W. Va., and ascended the several long steep grades on the west side of Backbone mountain to the easier slopes on the eastern, or Potomac river, side we had passed through so much wild and almost uninhabited country that something less rough and rugged, but with better average roads, would have been a welcome change. It was the first time any of us had come up that way from the "Little Mountain State" into western Maryland, and no one suspected how soon, or how completely, our hopes were to be realized.

Completed in 1915

Immediately after passing the low stone marker at the interstate line, 43.2 miles from Elkins, the road began to show a material improvement. Though being neither on a direct route to Baltimore nor between any two county seats, the remaining 12 miles to Oakland had to be constructed entirely on the State Aid plan instead of entirely by the state. Completed in the fall of 1915, it became at once the most important link between the still primitive highways of interior West Virginia and the wonderful all-State road from Oakland to Keyser's Ridge on the National Turnpike. After a fairly long and usually restful stretch, particularly to one who has just driven up from the rougher sections of the neighboring state, it crosses the Little Youghiogheny river, a short distance above the point where it enters the narrow strip of country sketched on the map and makes a square left turn about midway between Oakland and Mountain Lake Park.

If one has time for a very interesting detour, or expects to stop for noon or night in that locality, it is usually preferable to turn right at the end of the road just north of the concrete bridge over the Little Yough, and continue on to Mountain Lake Park or to Deer Park a few miles farther east, though that would lead off of the present improved surface. Plans are under way to include both of those places in the enlarged State Highway system, at first by the extension of the present road to make a loop from and back to Oakland, and ultimately by reconstructing the already existing but inferior route, mostly along the north branch of the Potomac to Cumberland. Though traversed by many streams, western Maryland has surprisingly few lakes, among which are the ones around which these little mountain resorts have grown up, and the state undoubtedly will make them more easily accessible to motorists in the future than they have been in the past.



To the Mountain Village

After making a left turn at the junction of the two roads or running straight west past the point if returning from the side-trip to Mountain Lake or Deer Park, the State Aid highway passes on the right the fine large courthouse of Garrett County, which includes the greater part of western Maryland, and brings one to the center of the picturesque little mountain village at Alder and Second streets. That courthouse may have more than ordinary interest for the motor tourist in view of the fact that its location here, after a long contest with Grants-on-the-Pike, made possible the fine highway north of Oakland by including it automatically under the Maryland law, within the system to be constructed and maintained entirely by the state. In making the right turn from Alder street up Second street there is a glimpse of the B. & O. railroad, which now continues directly west and is not seen again on this trip.

The three, short, right-angle turns in quick succession, by which the easiest and best connection is made into the State road at the northern edge of Oakland, are all that hinders a literal "flying start" out of the center of the town, while only a short distance from the first straightaway to the end of the splendid interstate route

at Keyser's Ridge. It seems as if the wheels could hardly be in contact with the ground. More perfect construction or more careful maintenance would be difficult to find. Every mile is regularly patrolled, and the slightest imperfection either fixed at once or reported to the higher authorities. Maryland roads generally are crowded higher than those of Pennsylvania, New Jersey or New York State. This specially favored stretch is no exception, and the eye seldom finds a hollow where a pebble could be placed without at once rolling off.

Reasonable Speed Is Safe

Reasonable speed on such a road is safe and thrilling—in fact almost irresistible, though quite likely the driver, with the mental consent of all the others, compromises with conscience by an informal resolve that at some future time he will return and study the surrounding country at real leisure—perhaps afoot. The atmosphere is rare and gently stimulating. Fairly distant objects seem to draw nearer and become more distinct, even while one is actually speeding away from them. Though never as rough or wild as interior West Virginia, the country traversed by this road has a quiet, restful beauty and an infinite variety which invariably charms the first-time visitor and holds the attention of those who come again.

It is a ridge road throughout, having an elevation of 2461 ft. at Oakland and 2880 ft. at Keyser's Ridge and only a few slight intermediate depressions, caused by descents to cross the principal streams en route, the lowest point on the entire line being about 2000 ft. at the concrete bridge over Bear creek. Most ridge roads are only a few miles long, and then not of the same character throughout, but this is literally so from end to end, and any section of it, even if considered apart from the rest, could be described correctly by that term. This particular ridge, which fortunately is well adapted to accommodate a great highway trending nearly north and south, is about midway between Negro mountain, which looms up on the right, and Winding ridge, whose easier slopes are hardly less conspicuous over to the left.

Ridge Is Fairly Open

These three ranges—of which the one we are following occupies approximately the center—are the successive steps by which several elevations of 2900 ft. or more on Negro mountain are graduated to an average of less than 2000 ft. at the Youghiogheny, an air-line distance of not more than 8 miles, which helps to explain the wonderful views. An interesting feature of this ridge is that it is not covered with dense forests and huge rocks, which would have made the building of such a road extremely difficult; but is fairly open and so moderate in its contours that only a few comparatively easy realignments were necessary to adapt it to modern travel. In fact the present splendid State highway follows the line of the old road except in two places where shorter distances, easier grades and fewer curves were obtained by slight variations.

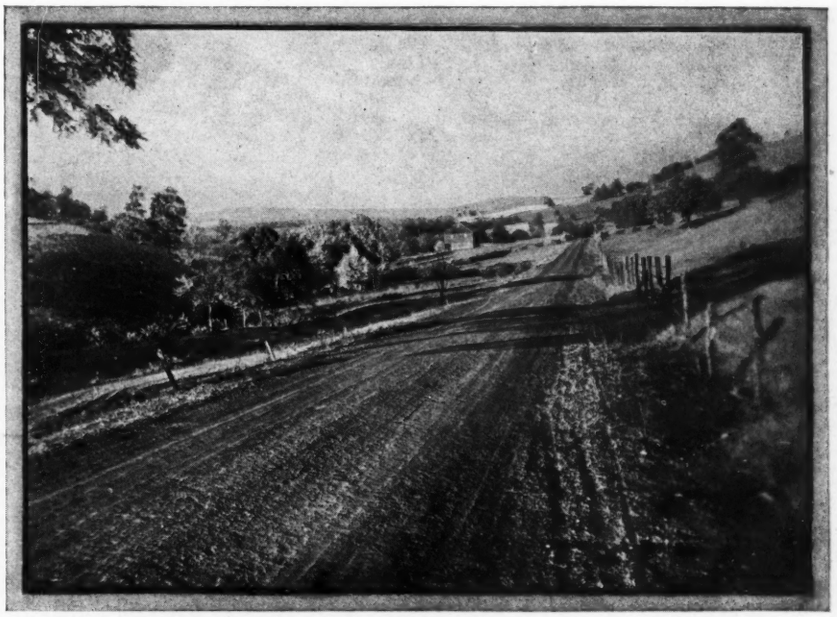
With one exception, and that probably dating back to the old road, all the bridges are of strong concrete, and the curves, which are invariably wide and safer than many on important routes in New England and New York State, are protected by guard rails painted white. Nowhere is there a chance to lose the road, as it follows the summit of the ridge and not a single improved side-road is noticed. So great has been the change brought about in that section by the completion of this one predominant thoroughfare that travel has been largely taken off the short-cuts of former days, such as from McHenry or Accident to Grantsville and Mountain Lake Park, the great majority of users of all vehicles preferring to follow the longer but perfect ways around by Keyser's ridge on the north or by Oakland on the south.

An occasional explorer, hunter or emigrant, or possibly small bands of Indian warriors, may have gone over the Ridge road in the long ago, but it was never much used before the coming of the motor car, and then not to any extent by outsiders, until its improvement was well under way. Now it assumes a special importance as a connecting link between central and northern West Virginia, across a portion of western Maryland into Pennsylvania and even up to western New York by much the shortest and most interesting route between these sections. Though a great natural thoroughfare, it is just enough off the beaten tracks between the East and the West to be discovered and traveled mostly by those who have some special interest in coming to and over it. From Oakland to Thayerville, a small cluster of houses 8.7 miles out, there is nothing to detract one's attention from the perfect roadway and semi-mountainous scenery, but not far beyond there is a long gradual descent to Deep creek, the first considerable tributary of the Youghiogheny on this stretch, the corresponding rise on the other side bringing the tourist into McHenry. The views along the 3 miles during which the road leaves an elevation of 2500 ft., crosses a concrete bridge in the bottom of the ravine, whose right-hand escarpment is the extreme lower edge of Negro mountain and returns to an elevation of 2475 ft., are kaleidoscopic. Slightly less than 2 miles beyond McHenry, a right turn with the macadam identifies the beginning of the first material variation from the old road, which not only saves distance but provides an easier grade along a rippling brook.

Country Gradually Opens

After following the inevitable ridge through a picturesque gulf along the south branch of Bear creek, the country gradually opens up. It is visibly less like West Virginia and more like Pennsylvania. Small streams grow in number, and, regardless of the directions in which they seem to run through these highlands, their waters ultimately find their way into the Youghiogheny, Monongahela, Ohio and Mississippi, for the Oakland-Keyser's Ridge road is altogether on the western slope of the Alleghenies. Presently the tourist enters the fairly long and almost level straightaway across the plateau on which the attractive little town of Accident is situated.

This is a section of extensive woodlands, fertile soil, beautiful glades and fine valleys, traversed by many clear, swift streams, and covered by vegetation of the richest kind. Now and then the traveler catches a glimpse of the finest living green—usually along the bed of a stream at the



An idyllic stretch on the Ridge road, across which there is on bright days a wonderful play of sunlight and shadow

Where the scenic speedway crosses one of the highest points; also where the snow piles high in winter

foot of some hill almost weighted down with verdure. An interesting feature about these hills is that they are seldom irregular or sharp in outline but usually well rounded and often cultivated to their extreme tops. The country seems equally attractive in the height of summer and in the full, rich glory of autumn.

Accident, though with only about 300 inhabitants, is the largest place along the line and can be seen from a considerable distance as one comes up from Oakland. Just beyond the town is the second important relocation, by means of which the circuitous route followed by the old road is left by a bold piece of new construction almost direct from Accident along the valley of an unnamed stream, which seems to have been entirely overlooked by the original road-builders. The descent by this new road into the valley of Bear creek, and out of it by a corresponding grade on the north side, is more spectacular than the crossing of Deep creek, a few miles below. Both send the waters they gather in these highlands to the Youghiogheny.

Origin of Town's Name

Nearly every stranger making this trip wonders how the name "Accident" happened to be given to this little mountain village, and the question has been asked so many times that the writer undertook to discover the reason, addressing an inquiry about it to an official of the State Roads Commission, Baltimore, a resident at Accident and a motorist at Oakland. The replies show a wide range of opinions, which are briefly summarized herewith.

The official of the State Roads Commission writes that it is "a tradition antedating all others," that during his inspection for Governor Dinwiddie of Virginia of the lands from the Potomac river to the forks of the Ohio, where Pittsburgh now stands, then considered as belonging to the Old Dominion, the youthful George Washington did some surveying up the Cove and along Keyser's ridge. On one occasion his transit was knocked over and his instrument partially destroyed by a loose boulder from above rolling upon them, which caused him troublesome delay —hence "Accident." At least this is an interesting story, and perhaps as authentic as any others to be obtained at this late date.

The resident of Accident says that the place derives its name from the shape of a tract of land registered in the olden days at the Patent Office. It was noticed that the tract resembled the shape of an ax; so they simply added "i-dent" to it.

The motorist at Oakland writes that some time in the early history of that locality two surveying parties met there by accident—hence the name of the place to-day.

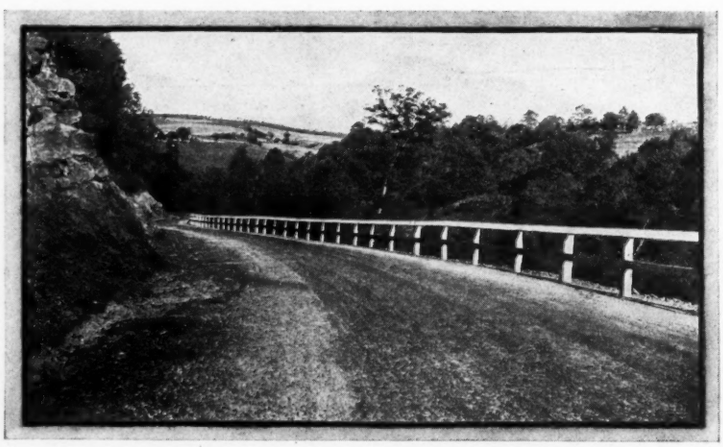
These are all interesting explanations, but none of them conclusive. Previous to the building of this fine State road, the only connection Accident had with the outside world was by private conveyance to Oakland, on the Cumberland-Grafton-Wheeling line of the B. & O. Railroad, 20 miles south, or to Friendsville, on the Confluence branch, about 5 miles west. It was a rare bit of luck for Accident that the county seat was located at Oakland, and that a road built by the State to connect its county seats should have been so constructed as to give it a splendid thoroughfare to the north and south.

About 2½ miles beyond the crossing of Bear creek the road comes to an elevation of 2805 ft., from which there is a wonderful overlook of the Cove, the local name given to a large area of farming land situated in a comparatively level, sheltered valley, extending northeast from the mountains along the upper side of Bear creek between Accident and the crossing of Keyser's Ridge by the National road. The proportion of tillable land here is very unusual in its extent for such a mountainous country. While the greater part of the Cove is west of the Ridge road there are also some splendid areas to the east. One is reminded of the celebrated farms of Lancaster County, Pennsylvania, though none of them have such picturesque surroundings as those in the highlands of western Maryland.

The last stage of the trip starts along the rim of the Cove, from which there are wonderful views in every direction. Looking ahead 2 miles or so, the tourist now catches a first glimpse of the great National road lying at right angles across his path and possibly wishes that it were much farther away. The Ridge road justifies its name to the very last foot, where, on a wind-swept summit 2880 ft. above the sea and only 36 ft. below the crest of Negro mountain, the tourist makes a right turn for Frostburg and Cumberland or a left turn for Uniontown and Wheeling.

TO VOTE ON ROADS

Chicago, Sept. 11—Meetings at county seats in various parts of the state to-day will decide whether the paving of 800 miles of highway will begin next spring. Two-thirds of the money has been provided by the $6,620,000 appropriations from the Government and the state. The meeting to-day will decide whether the counties will make this road work possible by paving the remaining third, a condition made at the time of the appropriations.



This beautiful road is just before the descent to Bear creek on the way from Accident to Keysers ridge

U. S. Standard Engine Approved

"Liberty Motor" for Airplanes Passed Rigid Tests and Is Adopted

WASHINGTON, D. C., Sept. 11—Special telegram—The standardized U. S. A. aviation engine which has been developed by motor car engineers for use in different types of planes for war service has undergone its special tests, and the mark of approval of the War Department aviation authorities has been placed upon it. The engine was designed specially to meet war requirements and to overcome the difficulty of having too many different engine models and the consequent trouble of having to carry into the war zone several stocks of supplies, which is essential where entirely different makes of engines are used.

The United States aviation engine is designed to use the same cylinders, the same valves, the same valve action, the same camshaft design and the same camshaft drive in four-, six-, eight- and twelve-cylinder models. One of the individual cylinders can be used on any one of the four models without change. Pistons are interchangeable in all four engines, and the connecting rods in two of the designs are interchangeable with those used in the other two, that is, the rods used in the four can be used in the six and those used in the eight can be used in the twelve.

Value of Interchangeability

Under this system of standardization an eight-cylinder engine can be transformed into a twelve by the addition of very few parts. The same applies when converting a four into a six. The value of this interchangeability of parts cannot be over-estimated, as it means practically one supply of spares for all four models, with the exception of such parts as crankcases, crankshafts and other parts which naturally cannot be interchanged in a six and a twelve or in a six and an eight.

This new aviation engine is really an international engine in that it is not simply an American product but rather a composition of the best aviation engineering practice in America, in France, in Italy, in Belgium and other countries in the war.

The engine is not an invention but an assembly of tested and tried units. Its individual cylinders represent the best practice evolved in Europe since the war began. The interchangeability of parts such as cylinders, pistons, valves, etc., is truly American and represents the interpretation of American engineers of war demands for varied types of engines needed for varied air services.

The United States aviation engine was developed primarily by two prominent engineers, whose names cannot be mentioned here. The work of designing, while started and superintended by these two, really represents the engineering talent of a score or more prominent engineers in the motor car and airplane fields. These engineers met in conference and, forgetting all features of design local to their different companies, set out to get the best available. They were called to this task by the Government to Washington to carry on the work soon after war was declared. In Washington, after laying their plans before the Aircraft Production Board, they were requested to evolve a design that would admit of specially rapid production and yet be an engine that would show up on even terms with the best European types in regard to power and weight per horsepower. Once in Washington these engineers literally locked themselves in a hotel and remained there until the major features of the design were evolved.

The work immediately took on an international flavor as the best practice in foreign lands was closely studied, the government supplying them with blueprints of the best designs in Europe and European engineers lending every assistance. France, England, Italy and the other allies held nothing back, and from captured enemy machines the latest practice in their work was studied. Everything that tended to hold back production was tabooed. No individual engineer was allowed to inject his own whims into the design. There was to be no experimentation—only an incorporation of what has been tried and found satisfactory in the war zone.

Designing a standardized engine of this type greatly facilitates manufacture. No announcement of the plans for manufacture have been given out, but undoubtedly the engine will be the United States' aviation engine no matter in what factory it is to be manufactured. The name of the factory in which it is to be manufactured will not in any way appear, any more than the name of a factory building ammunition would stamp its name on the shells made. It should be possible to place orders for such an engine in several factories and have the work done under Government inspection with one efficient corps of inspectors.

Adapted for U. S.

Some may wonder why the United States Government did not decide to adopt one of the efficient European aviation engines now used in the war zone and manufacture it. Such engines have been under manufacture in America for the allies for many months, and the manufacture still is being continued, but the adoption of such an engine as a standard for the U. S. A. was difficult because the design of most of them is such as to call for a considerable amount of hand labor, and as such they did not lend themselves to production to the extent considered necessary by the Aircraft Production Board. As little more than thirty days were needed to develop the United States aviation engine it is much better to spend that brief time in developing a type that can be manufactured in great quantities and which is designed with respect to American factories and American manufacturing methods. The present United States aviation engine, which has given such satisfactory results in tests that have been going on for weeks does not represent the final word in American aviation engine design but will be improved upon from week to week just as the engines of all the European warring nations are.

Each month sees a new engine come into the war spotlight and set a new pace. Engines that are leaders to-day may be trailers ten months hence. Because of this improvements may be looked for in the United States engine as developments at the front warrant.

Willys-Overlands Cruise

300 Dealers and Distributors on Three-Day Lake Trip

CHICAGO, Sept. 8—After a turbulent night on Lake Michigan aboard the S. S. South American, 300 dealers and distributors for the Willys-Overland, Inc., disembarked here this morning, were piloted through the loop district headed by two bands, taken to the local salesrooms and service station and met this noon at luncheon at the Hotel La Salle. This marked the finale of, or rather was an epilogue to, the retail sales contest which started last May and finished Aug. 22. During this period 47,242 cars were sold, their retail value being $39,650,725, and the contest among dealers and distributors was so arranged that everyone entered on an equal basis. First prize went to Henry Walker, dealer at Dillonville, Ohio. Although Walker's town has a population of 1519, he sold ninety-seven cars.

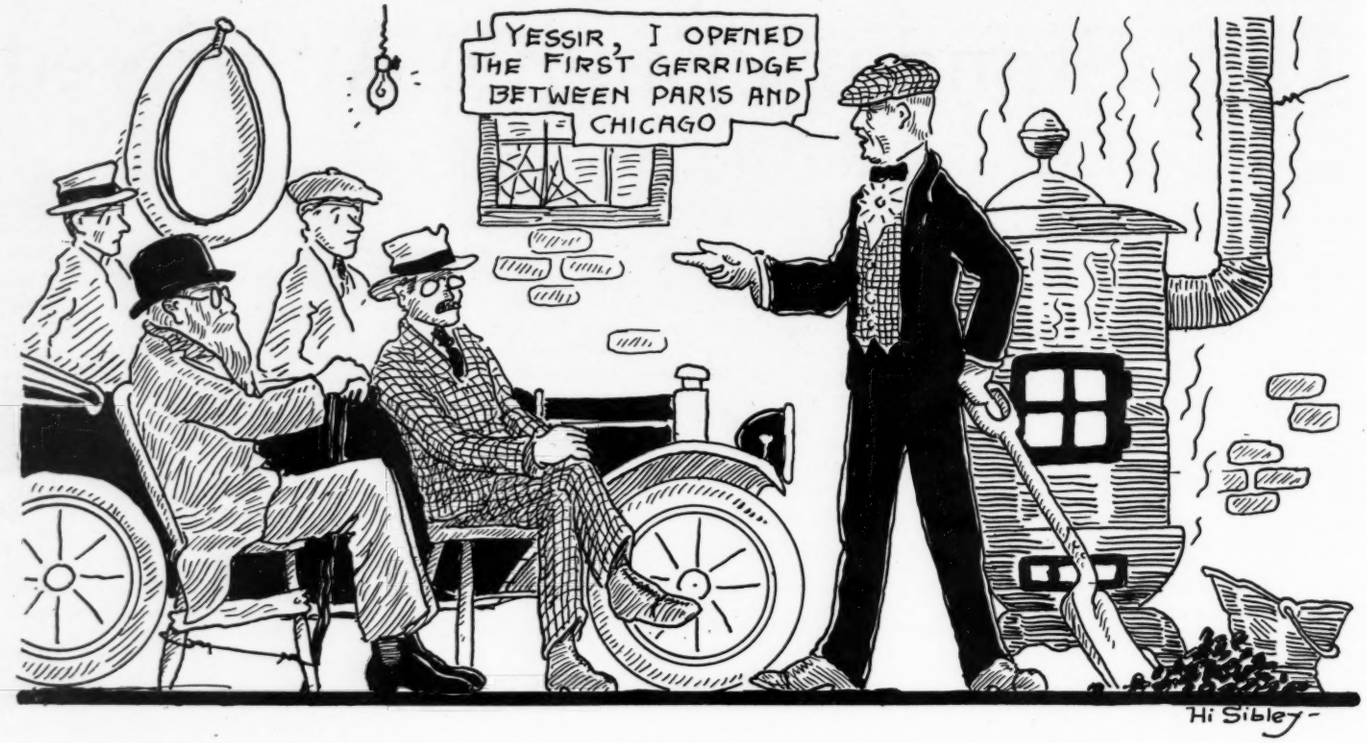
All the expenses of the sales congress and the expense of the delegates were borne by the Willys-Overland Co.

The cruise which ended to-day occupied three days, the company chartering the South American for the trip. The dealers and distributors disband this afternoon.

$12,500,000 FOR AUGUST GOODYEAR

Akron, Ohio, Sept. 8—The Goodyear Tire & Rubber Co. celebrated its sales achievements for August by giving thirteen shrill shrieks on its factory whistle—twelve long and one short. It was an announcement that the August sales amounted to $12,500,000, the height of the company's achievements. The company had set this amount as the goal for August and so well did it come up to its mark it overshot the quota by $77,000.

Goodyear business for the first ten months of the fiscal year now stand at $89,000,000, which insures a 1917 business of well over $100,000,000.



Tales of the Alley Rats—No. 1

The Fire-Proof Captain

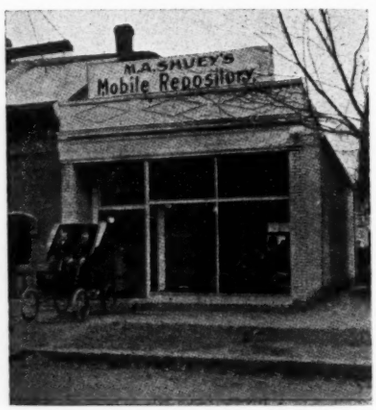
By Hi Sibley

THIS is the first of a series of articles based on the stories told by one of the industry's rich characters. Captain Shuey, or Cap, as he is more often known, is a pioneer dealer, and his tales are of the early days when a dealer's life was very extraordinary indeed. The next of the series, to be published in an early issue, is "The Mad Mobile."

IF you should happen to be strolling along the main street of a certain Indiana town and, in the neighborhood of Pommert & Jay's barber shop, observe a man or two men or a group of them slipping down the alley, do not infer at once that they are bound for a side entrance or a poker game, for more likely than not they are merely Alley Rats headed for their innocent rendezvous.

"Alley Rat" is not the most elegant term to apply to a citizen of substantial habits, but thus Captain Manlove A. Shuey, proprietor of a snug little alley garage, pleases to designate those individuals who are wont to drop into his place of business to hear his thrilling tales of adventure. If you had ever met the diverting captain you would readily understand why the Rats' Nest is so popular, and why callow youth and graybeard alike can be found there at any hour of the day, eyes bulging and sensitive ears aquiver as their host relates how he rescued seventeen hysterical women and one French poodle from a watery grave or strangled a raging Bengal tiger with a pair of red suspenders.

The captain is a most unusual character. He has been engaged, at various times, in scores of different pursuits. His principal distinction—we take his word for it—is that he established the first "gerridge," as he calls it, between Chicago and Paris. He spent his young manhood as an acrobat in Brady's circus; later he sold melodeons to the Kickapoo, or something, Indians in Nebraska; drove in horse races; piloted a river steamer; in fact, he has done about everything conceivable except occupy a pulpit and undoubtedly would have tried that had it paid better.



Captain Shuey's "gerridge" as it was about 1902

When you take a man who has done all these things and add a hospitable disposition, a robust imagination and a tongue that is hung in the middle, you have some explanation of his rare magnetism. To do him justice, however, it must be said that his veracity never has been disputed, and beyond one or two harmless swear words indispensable to so emphatic a man and a well developed taste for Fast Mail fine cut, he has no vices. Those who have known this kindly gentleman for years, and they are many, have found him a tried friend and true.

In appearance he is rather striking; tall, straight, smooth-faced and with thin hair so light that one could not say at first glance whether it was gray or blond. He could not be called young; yet certainly he is not old, for he has the keenest of minds and a most active body. Invariably he is attired in a black broadcloth suit, immaculate white shirt setting off a mature diamond, black bow tie, patent leather shoes and gaiters, the tout ensemble topped by a jaunty Scotch cap. This is hardly the outfit any other man would chose for carrying on a small garage business, but Cap manages to keep himself always as neat as though he had just stepped from prayer meeting.

As for the Rats' Nest, it is a disappointing contrast to the caliber and spotlessness of its distinguished proprietor. Here is a dingy little brick structure perhaps 20 by 30 ft., dimly lighted by three smoky windows, and into which are closely herded five or six little T-A-D cars for which Cap

is the local agent. Around the battered stove is a semi-circle of decrepit chairs, two ancient settees and a wobbly piano stool, the last remaining relic of Cap's music store days.

Worse Than Skinning Knuckles

On the occasion of this chronicle all the seats were occupied, the overflow filling the tonneaus of the two cars nearest the stove. In the early part of the rapid-fire conversation someone had made a comment on the absence of sprained wrists, and worse, since the advent of the self-starter, and turning to Cap had inquired:

"Cap, you've been in the game longer than anyone else around here. How's happen you never got bunged up any—why, you never even skinned your knuckles, did you?"

"Huh? Never even skinned my knuckles—never even skinned my knuckles, hey? I'd ruther have skun my knuckles than have the whole top of my head caved in!" Cap retorted with spirit. "See that?" he added, removing his cap and bowing his head to expose an indistinct hexagon-shaped scar on the top of his head.

We saw it. Cap resumed:

"Yes, and I had my hair and eyebrows burnt off at the same time, and had to stay home two weeks afore they growed out again."

"Tell us about it!" urged his listeners in chorus.

"Well," he began, refreshing himself

Cap

with a generous helping of Fast Mail, "I carried that hole in my dome sixteen years. You remember when I had that Mobile Repository over on Wayne street, where the Cash Market is now, Uncle Bill?" addressing the oldest member of the group.

"That was when I had that Locomobile steam wagonette. Had to operate on its vitals often and reg'lar to keep it in a willing humor. Got tired of layin' on my back in the grease under the machine to do it, so I dug a pit in the floor so's I could stand up to work and get corns on my feet instead of on my back.

"Along about dusk one afternoon I was tinkering with a leaky stuffin' box—always was tinkering with a stuffin' box on those cars—standing in that pit full of fumes and with grease and gasoline dripping all over me, when I dropped my wrench. I stooped down and groped around in the dark—didn't have no electric lights in them days—but couldn't find it, and without thinking what was going to happen, I lit a match.

When Wagonette Halted Exit

"Whoosh! That pit was light enough then to see the wrench, but I had immejit business elsewhere; I jumped up hard enough to carry me clean out of the pit and over into the next county, but I didn't get out because that darn wagonette was right over me. My head struck on one of the hex nuts on a connecting rod so hard I could feel it way down to my diaphragm. And that's how I got that scar, boys. I managed to scramble out blinder'n a bat and find my way home, but it was some time afore I could set up in bed and blink again. But shucks, that wa'n't nothin' to the time that little Mobile runabout tried to chase me out of my own garage.

"That was about as spry a time I ever did have, and——"

But at this juncture the telephone announced that Cap's supper was on the table, and supper being a regular and sacred rite with the doughty captain, he reserved the narrative for the next meeting of the Alley Rats.

Routes and Touring Information

Milan, Mo.-Bluefields, W. Va.

MILAN, Mo.—What is the best route from here to Bluefield, W. Va.?—George V. Thompson.

From Milan, drive to Laclede, Brookfield, St. Catherine, Bucklin, Mason, Clarence, Lentner, Shelbina, Lakenan, Hunnewell, Monroe, Oakwood, Hannibal, Kinderhook, Barry, Hadley, Baylis, New Salem, Maysville, Griggsville, Valley City, Bluff, Jacksonville, Berlin, Springfield, Mechanicsville, Decatur, Hammond, Atwood, Tuscola, Newman, Hume, Chrisman, Highland Corners, Montezuma, Rockville, Indianapolis, Rushville, New Salem, Andersonville, Metamora, Brookville, Cedar Grove, Harrion, Cincinnati, Newport, Ky., Alexandria, Grants Lick, Peach Grove, Caddo, Berlin, Powersville, Brooksville, Germantown, Maysville, Ohio river ferry, Aberdeen, O., Bentonville, West Union, Otway, Henley, Bertha, Portsmouth, Sciotoville, Wheelersburg, Haverhill, Hanging Rock, Ironton, Coal Grove Station, Ohio river ferry, Ashland, Ky., Catlettsburg, Kenova, W. Va., Huntington, Guyandotte, Barboursville, Milton, Culloden, Hurricane, St. Albans, Spring Hill, Charleston, Marmet, Montgomery, Gauley Bridge, ferry across river, Ansted Station, Rainelle, Meadow Bluff, Lewisburg, Caldwell, White Sulphur Springs, Allegheny Station, Old Sweet Springs, W. Va., Gap Mills, Keenan, Union, Willow Bend, Rock Camp, Lindside, Peterstown, Rich Creek, Narrows, Lurich, Glenlyn, Princeton, to Bluefield.

Vols 4, 5 and 6 of the Automobile Blue Books give complete running directions on this trip from Laclede to Bluefield.

Asheville, N. C.-Louisville, Ky.

Asheville, N. C.—Editor Motor Age—Would like best route from here to Louisville, Ky.—John S. Hopson.

As the road between Middlesboro and Crab Orchard will not be completed until next year, and the roads between Chattanooga and Nashville are in very bad shape, the route we outline below may appear rather roundabout. Very bad road conditions also exist between Chattanooga and Huntsville, so the route we suggest is via Knoxville, Chattanooga, Rome, Gadsden, Huntsville, Nashville, Mammoth Cave to Louisville, as follows: From Asheville, proceed to Weaverville, Grantville, Mars Hill, Marshall, Duell Hill, Hot Springs, N. C., Wolf Creek, Huckleberry, Newport, Dandridge, Jefferson City, New Market, Straw Plain, Knoxville, Concord, Lenoir City, Kingston, Rockwood, Glenalice, Roddy, Lorraine, Spring City, Sheffield, Evensville, Dayton, Graysville, Coulterville, Soddy, Daisy, Red Bank, Chattanooga, Rossville, Lafayette, Trion, Rome, Cave Spring, Hayney, Forney, Key, Hokes Bluff, Gadsden, Alabama City, Attalla, Mountainboro, Boaz, Albertville, Guntersville, Tennessee river ferry, North, Cottonville, New Hope, Owens Cross Roads, Huntsville, Meridianville, Hazel Green, Fayetteville, Bellville, Shelbyville, Deason, Murfreesboro, Walter Hill, Jefferson, LaVergne, Nashville, Madison, Edenwold, Goodlettsville, Green Brier, Springfield, Adairville, Russellville, Auburn, Shakertown, Bowling Green, Glasgow Junction, Cave City, Horse Cave, Rowletts, Woodsonville, Munfordville, Bonnieville, Upton, Elizabethtown, West Point, Meadowlawn, Orel, Shively, to Louisville.

Vol. 6 of the Automobile Blue Book, published at 910 south Michigan avenue, Chicago, contains complete running directions for this trip.

EDITOR'S NOTE

MOTOR AGE outlines route itineraries for its readers by letter. Each week only a few of the routes asked for are published, these being those of more general interest. In asking MOTOR AGE for routes, write your name and address distinctly on a return envelope.

South Bend, Ind.-Lynchburg, Va.

Mishawaka, Ind.—Editor MOTOR AGE—Give me a route from South Bend to Sweet Briar, Va., which is near Lynchburg, Va.; thence on to Boston and back to South Bend.—E. H. Ahara.

The route we suggest is by way of Mishawaka, Elkhart, Goshen, Benton, Ligonier, Merriam, Churubusco, Fort Wayne, New Haven, Van Wert, O., Delphos, Lima, Bellefontaine, Zanesfield, Marysville, New California, Dublin, Columbus, Bloomfield, Circleville, Chillicothe, Alma, Waverly, Piketon, Wakefield, Lucasville, Portsmouth, Sciotoville, Wheelersburg, Haverhill, Hanging Rock, Ironton, Coal Grove Station, Ohio river ferry, Ashland, Ky., Catlettsburg, Kenova, W. Va., Huntington, Guyandotte, Barboursville, Milton, Culloden, Hurricane, St. Albans, Spring Hill, Charleston, Marmet, Montgomery, Gauley Bridge, Ansted Sta., Rainelle, Meadow Bluff, Lewisburg, Caldwell, White Sulphur Springs, Clifton Forge, Lick Run Station, Gala, Fincastle, Troutville, Roanoke, Blue Ridge, Thaxton, Bedford City, Lynchburg, Amherst, Sweet Briar.

Vols. 4 and 6 of the Automobile Blue Books, published at 910 South Michigan Avenue, Chicago, contain running directions for this.

Motor Pioneering in B. S. A.

Hupmobile Breaks Trail in Transvaal

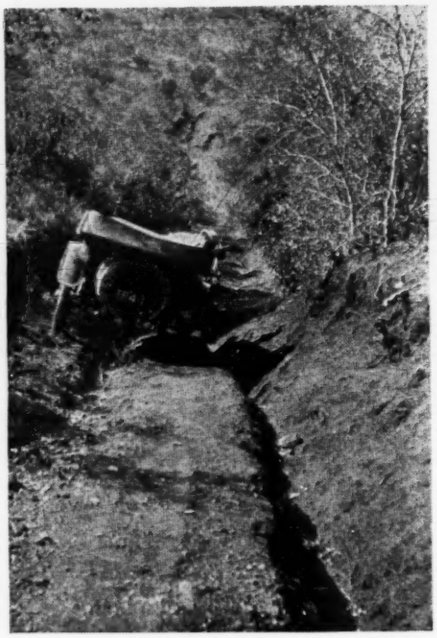
THIS is a story of motor car, mountain and veldt. In it you learn that the hippo sometimes contends with the pumpkin, antelopes blunder among the tomatoes, early day walkers flush coveys of lions, crocodiles reign over fishing and bathing, while the gleam of the headlight and the sound of the engine are signs of upheaval that comes once an age. The story is on the best of authority. MOTOR AGE gets it from the African Motor of British South Africa, in which it is told by E. Collins, the brave garage man, who in chariot yclept Hupmobile set forth from Pretoria on fair lady's challenge to dare unmotored paths.

The Challenge

Through Premier Mine, Bronkhorstspruit, Middelburg, Pokwani, Lydenburg, Pilgrim's Rest, Sabie and Nelspruit to Barberton the motorists sped. A pause only to show what the car could do, when Pilgrim's Hill with its 29 per cent grade was near, and then the real pioneer journey began, for never had motor car linked Barberton and Piggs Peak. The challenge? That came at motor show time, when all good dealers gathered at Johannesburg to honor cars en masse.

Just beyond Pilgrim's Rest were the MacMac Falls, where the Sabie river drops 300 ft. Rainbows span the waters, and the delicate ferns grow in the spray that beats the cliff there. Tree-filled depths in which birds fly are there; ahead there is a glimpse of the vast veldt beyond the Berg.

The roads are fair as country roads go, with one or two exceptions. Since the railroads have been built in British South Africa road work has been neglected. At Barberton, the beginning of the real trip, there was nothing but ridicule for the motorists, so preposterous was it thought to try to go to Piggs Peak.



The way led over this remnant of a road, over a road out of use for 25 years or more

"I suppose you don't know," said one hardened old veteran, blowing back the froth from an enormous beer, "that you can't take a bullock wagon across there!"

A guide was found, however, and very early in a morning of the merry month of May the start was made. Not until after 16 miles did any serious difficulty appear. Then the junction of the Queen and Kaap rivers was reached, with an approach to the crossing through heavy sand. The car crashed into a broad belt of reeds 10 ft. high which fringed the water edge, and on getting through saw a bullock wagon loaded with old mining material abandoned in mid-stream. The crossing had been too much for one traveler. Between the car and the wagon lay a still, murky pool. The driver suggested someone wade through before the car tried it, but the guide said not; there his pointer dog was snapped up by a crocodile as he was returning from his last hunting trip.

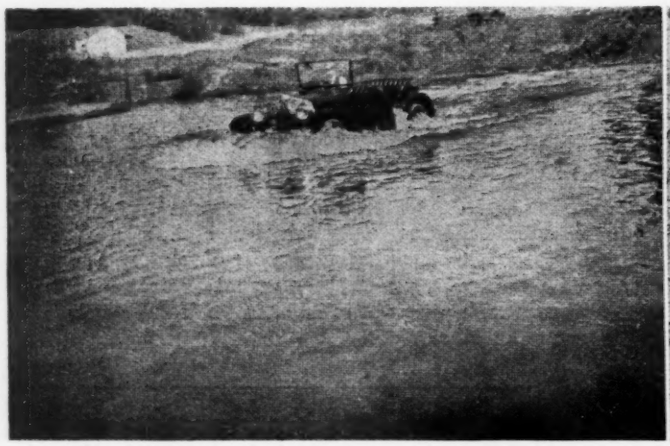
A native appeared at the critical moment to tell of a better crossing higher up, and the car went back through the wretched sand and up and down a bank, coming to a full stop as it struck a stump hidden in the long grass on the other side.

Path of Old Mines

Already the way had led past many old mines, among them the Clutha, Victoria and Woodstock, all abandoned long ago, and the Golden Valley, where remains of the old Portuguese workings still could be found. For 2½ miles the road was along an old water race, constructed at enormous expense for mining, but also abandoned. The motorists saw the old workings of the Cerro de Passes mine, which is said to be one of the biggest swindles ever placed before the public. The chairman of the company was at one time lord mayor of London. The company was floated in London, and a good deal of capital was used to develop the mine, but there was no gold.

The river was crossed four more times before the car reached Avoca, at the hotel of which, while Mr. Collins' party sipped lemon and soda, the proprietor told of the palmy days when the town was a noted mining camp with a population of 300 whites, with five fully-licensed hotels and one bottle store, all doing a roaring trade.

"The wild aspect of this part of the



This crossing, that of the Sabie river, certainly was not built for a motor car, even a pioneer

Not water lilies but unbending stones deck the waters at the junction of Queen and Kaap rivers

country well can be imagined," says Mr. Collins, "when it is known that only two years ago a hippo of gigantic proportions and enormous appetite took up its residence near a series of pumpkin patches, to the great disgust of the owners. It was only after the local sportsman had flattened two bullets on the hindquarters of this hoary old veteran that he was induced to return to his original home. Even to this day there are still a number of hungry crocodiles always loitering around the deeper part of the river, and, consequently, fishing and bathing are not at all popular in the vicinity."

The hotel proprietor, with a humorous look on his face, agreed to see the motorist across Sheba creek. He was expecting to see some fun, as the car was the first ever in Avoca. The creek is known more popularly as Fig Tree creek, as a gigantic wild fig tree, which is still flourishing, stands a few yards from its bank. Lovers of the book "Jock of the Bush Veld" will remember that under its branches is the last resting place of this immortalized member of the canine tribe.

No vehicles cross this creek now, and the sight of the gray, slimy deposit flowing from the Sheba mine filled the faces of the motorists with disgust and, incidentally, broadened the smile on the hotel proprietor's usually grave face. The car crossed. The provisions on the running board, forgotten, paid for the crossing with their death. They resembled nothing so much as the cyanide flavored mixture through which the crossing had just been made. The car emerged a lovely shade of French gray.

The crossing of Honey Bird creek was even worse. Before coming to it the car met with a series of difficulties in the form of rivers, washed out drifts and dongas.

The railroad is the only way to get by thick brush, and then the front axle scrapes the rail

To cross Fig Tree creek the car had to negotiate the slime from Sheba mine, but it crossed

There had been a wagon drift at the creek about twenty-five years ago, but it was only after a minute search that it could be found. Axe, pick and shovel removed the bushes and reduced the almost perpendicular sides before the car could descend. Even then the air was filled with a smell of burning rubber from the friction produced by rear wheels whirling around in the loose, treacherous surface.

It was late in the day when the crossing was made, and after reaching the summit of a considerable rise in the "path" the motorists were glad to see a light in the window of a farmhouse. The owner came out to meet the car and when he came under the glare of the headlamps his face was seen to have a look of anxious perplexity. He confessed that as he heard the purr of the open exhaust and saw the powerful light shining out of the bush he thought there was an earthquake and the end of the world had come.

The car climbed Pilgrim's Rest hill, whose grade is 29 per cent, to show what it could do

The car was to stop for the night at Jack Dreyer's Hotel in the direction of Louws creek, and as the rumbling of thunder and falling of raindrops warned of an approaching storm the motorists hurried on. They felt they had earned the rest and luxury of shelter. The nature of the country traveled tells the tale. It had taken a day to travel 31 miles, a day of 10 hrs. and 40 min.

After breakfast at 9:50, Mr. Dreyer saw the party across Revolver creek, about which there were many misgivings until it was reached, when it proved in no way as bad as many already encountered. There was a sheer drop of about 5 ft. on the

It would not be hard to think the car moving on water here, but it is sand instead

A right royal welcome by native police on arrival at Pigg's Peak, the end of the pioneer journey

banks, but the driver assured everybody that he only wanted the sharp edges taken off and it would be a simple matter—which it was.

While one of the motorists was rubbing his hands and caressing the pick the idea of using the railroad tracks for a short distance was adopted. The decision afterward was regretted as, in spite of the fact that it looked the easiest way, it turned out to be exceedingly difficult to climb up the embankment and get the car over the rails. As the car passed over the sleepers, the front axle would tap the rail, while at one point it was sliding along with one front wheel gaily revolving in the air.

The First Car

Another mile and Tonnetis Siding. A hearty welcome from the Tonnetis brothers was mixed with amazement at the sight of the car, for you will remember this was the first car in this part of British South Africa. A stop was made to look over the magnificent plantation of pawpaws, egg fruit, bananas, watermelons, pumpkins, beans, tomatoes, etc., all being grown in huge quantities for market. Seventy acres were under irrigation.

A few miles of fairly hard going brought the car to Pettigew's Nek. It was at this junction that traces of the old transport road could be seen dimly in the long straight stretches of tall white grass, which, like trees on either side, gave a kind of avenue effect. Risks of stumps made possible a speed, in places, of 25 m.p.h. Then quite suddenly these conditions changed and the car crashed through the thick thorn bushes where no opening showed. Not long and the house of Pat Murphy was reached, where even his rich brogue was halted in amazement at seeing a motor car at his door. He said the car would never cross Jam Tin creek.

From this point the difficulties increased, and by the time Jam Tin creek was reached everyone was ready to camp for the night. A suitable crossing could not be found. Finally a fallen tree was launched down the bank so that a crossing could be made anyway, and the car started down the almost perpendicular bank. So steep was it that the water from the radiator poured out through the overflow pipe, while on the opposite side the carbureter was flooded. The surface of the bank was of a sandy nature and the wheels spun around without getting a grip. A corduroy path of sticks brought the car up in fine style.

Plenty of Big Game

Night was spent with Rupert Atmore, who did not show so much surprise at seeing the car, as he had returned recently from Southwest Africa. Big game abounded at this stopping place. Koodoo and sable antelope regularly drank within a few hundred yards of the house and were doing great damage to the tomatoes and other cultivated plants. Lions frequently were heard across the river. Two weeks before Mr. Atmore had shot a crocodile on the sand banks and about two months before, while out on a stroll with his wife, three lions crossed their path.

The next morning a drive through the brush showed innumerable varieties of wild birds and animals. A slightly used wagon road made the going better farther on and soon the road leading to Pigg's Peak was reached. That night the motorists stopped in the Ho Ho district, often described as the Horo district. Two miles from the back of the store are the gigantic caves reputed to be the original Sir Rider Haggard's "King Solomon's Mines." Here herds of cattle and their owners have hidden during bygone native wars, while 12 miles away is the now abandoned French Bobs mine, in which a certain Mr. Coats of cotton fame is reputed to have lost very heavily.

The next morning the car arrived at Pigg's Peak mine, where the lady of the challenge lived, Mrs. Ross Garner, the wife of the assistant commissioner of Swazieland. The object of the pioneering trip accomplished, the return to Barberton was made by another way and one about which no story is available. In the trip of some 3,000 miles of the worst possible roads the Hupmobile had had only three punctures, and the same tires were still on the car that were used by the maker. Incidentally, it had broken the trail for more cars.

The Passing of the Horse

Marlin Springs.

AS I write these lines, I am looking down the Live Oak street, the main thoroughfare of Marlin, county seat of Falls county, Texas. It is just the busy hour of the day, 5 o'clock in the afternoon. It is the time when the cattlemen and farmers come in to do their shopping. It is just the time of day when in other years 200 cow ponies would have stood on either side of Live Oak street, outside the stores, waiting patiently for their masters.

Today, far down the street near the corner and in front of a drug store, stands a solitary pony. He looks as out of place almost as he would standing outside the Claridge waiting for Wilson Mizner.

On either side of Live Oak street for blocks are parked all shapes and forms of motor cars. They are standing just as the cow ponies used to stand, at an angle, facing with their radiators pointed toward the curb. And this is Texas, home of the cowpuncher and the romance of the cacti and sage brush!

The day of the horse has passed here, as it passed years ago in the East. He held out longer in Texas against the inroads of the mechanical engines of man, but at last he has given way.

Distances are long here in the Southwest. People have all the great plains of Texas to spread themselves over, and they have taken full advantage of it. They find that where a hundred miles is several days' journey for a horse it is only a few hours' work for a Henry Ford.

As I write a Henry has just pulled up to the door of Turner's saloon. Out of it have stepped four cow-punchers booted and spurred! Somewhere they use the horse still, or why the spurs? But it is out on the ranch punching cattle or in riding over the farm, not in coming to town.

The population of Marlin is about 6000, counting people living on the ranches and farms adjoining the city. Seven hundred new automobiles have been sold here within the last year!

When I was a boy in El Paso every second youngster rode his pony to school. They hunted and raced on horseback in the evenings. It was so all over Texas.

Youngsters of fourteen and less drive their machines to school here. I rode over to Waco on a particularly black night not long ago with a sixteen-year-old boy, who told me he had been piloting a car for five years.

Just as they were rough riders on horseback, so the Texas boys are Barney Oldfields aboard a motor. Over roads that were deep in ruts and full of turns this youngster took me to Waco, a distance of about 30 miles, in 55 min. I'll say that this is as great a driving feat as 110 miles an hour is at Sheepshead Bay.

Verily, the old order changeth. The day of the horse has passed forever. Even in his former stronghold out on the plains of Texas he is obsolete.

—From In Midchannel, New York Evening Mail.

EVERY ROSE HAS ITS THORN!

Des Moines, Iowa, Sept. 7—Every rose has its thorn and there's many a drawback to some of the best in life, and Iowa is no exception. What though Iowa has a car for every ten persons? If you have to leave the family car at home Saturday nights, when every Tom, Dick and Harry seeks the bright, white lights of the downtown district, then somebody indeed has taken the joy out of life. One Iowa town has so many farmers who own cars in its vicinity that it has been found necessary to ask the residents of the town to leave their cars at home on Saturday nights so that out of town visitors can find room to park their cars. Says the Tabor (Iowa) Beacon:

"Leave your car at home Saturday nights, you who live in Tabor or who live close in, especially. It is a very difficult matter for people coming in from the country or surrounding towns a little late Saturday afternoons to find a place to park their cars. Every place taken by a citizen of Tabor makes one place less for the parking of the cars of those who drive in from the country or from the surrounding towns."

CARS SEEK CITY STORES

Kansas City, Kan., Sept. 7—The rural free delivery system in Kansas brought about the abandonment of practically 400 rural postoffices, and the motor car, fast becoming more and more of a farm necessity rather than a luxury, is causing the abandonment of country stores.

The farmer has become independent. No longer is he forced to take his trade to the small country store because of the distance between him and the city. Instead of taking a whole day off to go to town or sending to the crossroads store he starts up his motor car after the day of work and goes to town, where he can pick and choose and where competition very often gives him the benefit of lower prices for his purchases.

Making the Show Circuit

Managers Meet to Plan Co-operative Work—Exhibitions Begins

CHICAGO, Sept. 8—The dealers' shows in several of the country's largest cities plan to save thousands of dollars this coming winter through a co-operative printing and decorating plan that was worked out tentatively yesterday and to-day by the National Association of Automobile Show Managers. The organization was formed in this city last winter, and this is its first real big work.

It is proposed to submit to a contractor a list of shows with dates. The contractor will visit soon the cities that are in the plan and will submit drawings of plans for decorating. Competitive bids will be secured in some cases. At the meeting yesterday and to-day half a dozen different decorators who appeared before the association estimated that by a plan of this kind the decorations could be re-used in whole or in part in several cases and a saving of from 33 to 66 per cent effected as compared with the price for a single show.

Heretofore each show has bought its own decorations, has used them once and has then junked the major portion of them, buying new for the following year. The proposed plan will give each city a distinctive show and in some cases will provide the dealers with a far more beautiful exhibit than heretofore has been obtainable, and at less money.

A committee also has been appointed to secure a design for a poster to be printed in large quantities with the name of different shows imprinted. The same design will be used for one-sheets and stickers, of which it is estimated that at least 2,000,000 can be used.

The managers also compared different entrance ticket plans, and each secured valuable ideas for use this coming winter.

The shows which have definitely entered into the co-operative plan, and which were represented by their managers, are: Boston, Providence, Albany, Cleveland, Milwaukee, Minneapolis, Kansas City and San Francisco. Other cities are expected to enter the plan as soon as certain details are settled locally. The chairman of the committee in charge is Chester I. Campbell, Boston; the secretary is Ray W. Sherman, *Motor World*, the associations's secretary. Co-operation is to be limited to members of the association, embracing about two dozen cities.

MILWAUKEE SHOW OVERFLOWS

Milwaukee, Wis., Sept. 10—The third annual fall show of the Milwaukee Automobile Dealers opened to-day at State Fair park, co-incident with the Wisconsin state fair and will close Saturday evening.

This year it has been necessary to erect a temporary structure of frame and canvas, 75 by 250 feet in size, as an extension to Motor Hall, and both of the buildings are filled to capacity with exhibits of passenger and commercial cars, accessory, supply, tire and motorcycle exhibits.

Four years ago motor car exhibits at the Wisconsin fair occupied tents and a small part of Machinery hall, a gaunt structure of concrete, consisting of pillars and concrete floor and roof. At the next fair, motor exhibits gathered in Machinery Hall, but in 1915 the state board of agriculture turned over the entire building to the M. A. D., for the presentation of a real show. The hall was rebuilt with steel sash and glass sides and ends, forming an exposition hall practically as substantial as any downtown show palace. Last year the M. A. D. completely filled the building, now designated as Motor Hall and had a small overflow.

For the rental of Motor Hall this week the M. A. D. is paying the state department of agriculture $4,000, and an equal amount has been expended in transforming it and for decorating the temporary annex. The fair management will build a permanent annex for the 1918 and succeeding shows.

The show, like all of the events conducted by the M. A. D. during the last nine or ten years, is under the management of Bart J. Ruddle, assistant secretary and manager of the M. A. D., who recently took charge of the affairs of the National Automobile Dealers' Association as executive secretary. N. E. Osmond of the Osmond Motor Car Co. is chairman of the M. A. D. show committee.

200,000 AT INDIANAPOLIS

Indianapolis, Ind., Sept. 8—The sixth annual Indiana state fair motor show held this week under the auspices of the Indianapolis Automobile Trade Association was the most successful show in the history of the organization. More than 200,000 persons passed through the show during the four days of the exhibit.

The show was conducted in a tent 300 by 150 ft. Fifty exhibitors displayed 175 different makes of cars. Eight accessory houses were represented.

Credit for the successful management of the show is given to Harlow Hyde. It is estimated that the show was staged at a lower cost, averaging 10 cents per square foot of display space, than any other show ever given by the association. Mr. Hyde eliminated $2,200 in expense in one item alone by so arranging the tent as to make possible the elimination of a board floor. A feature of the show equipment was a telephone exchange with direct connections with every booth. This convenience made it possible for prospective buyers to get in immediate touch with car salesmen and also made the transaction of business easy.

B. M. Wylie, president of the Indianapolis Automobile Trade Association, said the show was the most successful from all standpoints that had ever been staged at Conwell managed last year's show, the the fair grounds. No admission was charged. For once the weather favored the association. The attendance at the fair was one of the largest in its history.

350,000 AT TWIN CITY SHOW

Minneapolis, Minn., Sept. 8—Road building shown by models of various types and by motion pictures were important features of the Minnesota State Fair Sept. 3-8, which was attended by 350,000, as well as a display by the state forestry service of road maps to the Minnesota playgrounds, photographs of camping sites and models of how to build camps and to protect forests from abandoned camp fires.

One hundred and two new models of touring cars and thirty-nine trucks and truck units were shown. Twenty-two firms showed accessories, and forty-seven tractor companies and factories exhibited. There were chassis displays, methods of removing carbon, starters, operations of farm machinery by motor car power and demonstrations of tractors.

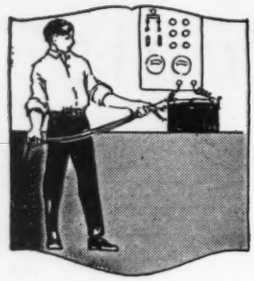
The show is the first opening of 1918 cars in this district. The used-car section drew well and about 1200 car owners responded to the call of Assistant Secretary R. B. Simning of the Minneapolis Automobile Trade Association for recruits to the Minnesota Motor Reserve of owners for call of the sheriffs of the various counties. Several dozen new units will be the result. A booth was maintained at the manager's office.

More than 20 per cent of the people attending the fair came from distant points by motor cars. The check at the gates showed as high as 3500 cars admitted some days, to say nothing of those parked in the Twin Cities. Cars were registered from nearly every state, and parties came as far as 300 miles. The mileage in the state is now about 140,000 miles of good roads, and this fact helped the touring to the show.

LOS ANGELES SHOW LATER

Los Angeles, Cal., Sept. 7—The opening date of the Los Angeles show has been postponed from Oct. 13 to Nov. 5. The Billy Sunday tabernacle with 65,790 sq. ft., a tent with 10,120 sq. ft., another with 25,600 sq. ft. and a third with 6000 sq. ft. will be used, giving 107,500 sq. ft., which makes this year's show the largest in this city from the standpoint of space.

To get the use of the Sunday tabernacle the show will not be open on Sunday but will run for six days only. War tanks such as are in use in Europe, armored cars and trucks will be displayed. New lighting effects, elaborate decorations and music are promised by J. S. Conwell, president of the Los Angeles city council and a dealer, who has been elected manager by the committee representing the dealers' association, under the auspices of which the show will be held.



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the sixtieth installment of a weekly series of articles begun in MOTOR AGE *issue of June 29, 1916, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the U. P. C. Book Co., Inc., New York, in a size to fit the pocket conveniently.*

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems, and the relations of current pressure and resistance were brought out. This was followed by an explanation of series and multiple circuits, how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was considered. A section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and the best methods of charging them. Magnets and electromagnetism then were considered, and the principles of generators and motors explained. A section on generator output was followed by one on the purpose and operation of the cutout. Electric motors and engine and motor connections then were considered. Ignition was taken up next.

Part LX—Battery Ignition Systems

THE relation between the time interval that the circuit is closed and the time interval that the circuit is open supposedly is the same regardless of the engine speed. Since the time intervals that the circuit actually is closed at any one time decreases as the speed of the engine increases, it readily is seen that the speed of the engine finally may reach such a value that the primary circuit may not be closed long enough to allow the primary current to rise to the necessary value to reduce the required intensity of spark. As a result of this condition the current actually taken by the primary circuit of a closed-circuit battery ignition system, as indicated on a suitable ammeter, decreases in value as the speed of the engine increases. The relation between current and engine speed for a four- and six-cylinder engine operated by a closed-circuit Atwater Kent ignition system is shown by the full lines in Fig. 332.

In the open-circuit type of ignition the primary circuit is closed for the same interval of time, regardless of the engine speed, and the primary current always builds up to the same actual value each time the circuit is closed. This results in the electrical pressure that is induced in the secondary winding and the spark being practically the same for all engine speeds. The current taken by such a system will increase in value as the speed of the engine increases. The relation between current and engine speed for a four-and six-cylinder engine operated by an open-circuit Atwater Kent ignition system is shown by the dotted lines in Fig. 332.

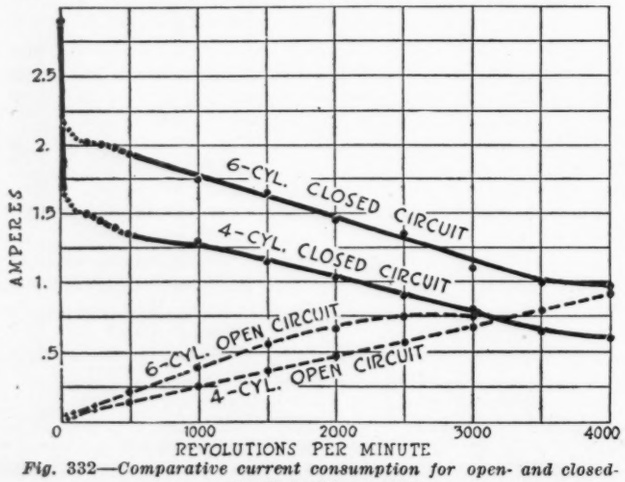


Fig. 332—Comparative current consumption for open- and closed-circuit ignition systems

The behavior of the various ignition devices may be investigated by a device called an oscillograph and all well-equipped experimental laboratories are equipped with one. By means of the oscillograph the variation in primary and secondary current with respect to time readily may be investigated. The results of an investigation of both closed- and open-circuit types of ignition by the oscillograph are shown in Fig. 333. The two upper horizontal rows of curves are for an open-circuit type of system in which the primary circuit is closed for the same interval of time each time the circuit is closed. The upper row of curves indicates the same maximum value of secondary current, or voltage, for all engine speeds.

The two lower horizontal rows of curves are for a closed-circuit type of system in which the primary circuit is closed for different intervals of times each time it is closed and the engine speed is different. For the high engine speeds the primary current is not closed long enough for the primary current to reach its maximum value, and hence the secondary current, or voltage, is not as high as it is at low engine speeds.

The operation of the open-circuit type of interrupter for the K3

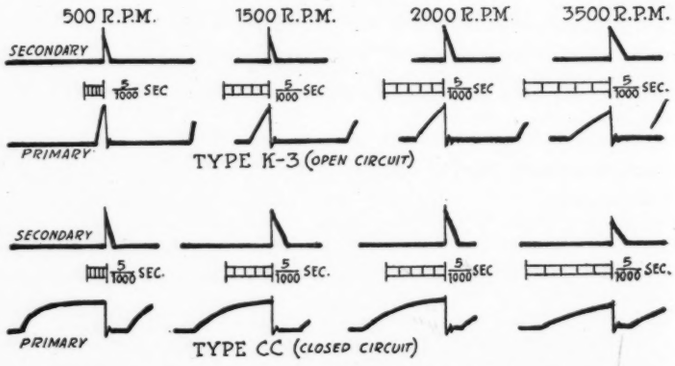


Fig. 333—Oscillograms, showing variation in primary and secondary currents for ignition systems

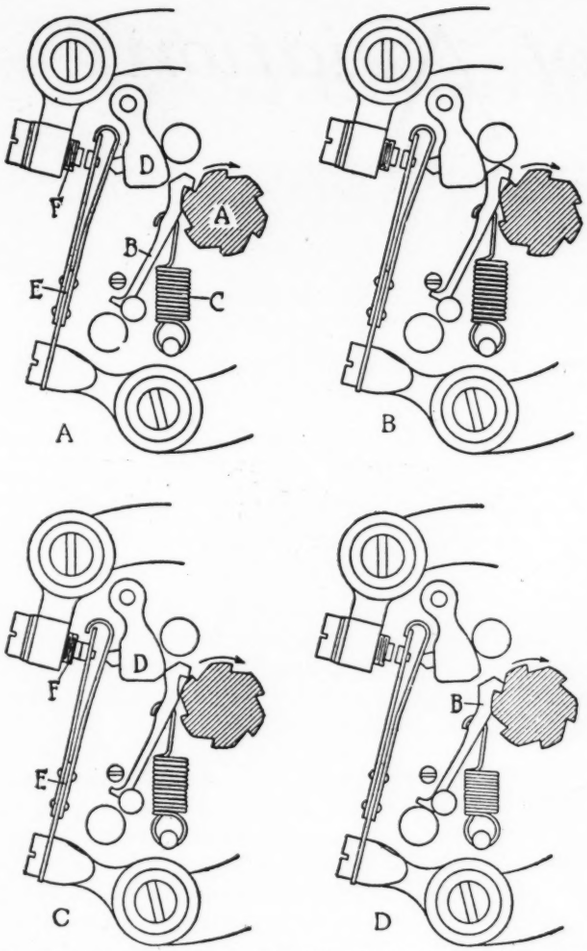


Fig. 334—Diagrams showing operation of Atwater-Kent interrupter

type of battery ignition system manufactured by the Atwater Kent Co. is in brief as follows: Four different positions of the interrupter in one of its cycles of operation are shown in Fig. 334. The ratchet A has as many notches as there are cylinders to be fired. The ratchet is mounted on the central vertical shaft of the device, which also carries a distributer and in this combined form is known as a unisparker. On four-cycle engines it is driven at half crankshaft speed on two-cycle engines at crankshaft speed.

The ratchet A engages the lifted B, and as A rotates its teeth or notches successively tend to draw B with them against the tension of the spring C. In doing so the head of B strikes the swinging lever, or hammer, D, whose motion in both directions is limited as shown, and the hammer communicates the blow to the contact spring E, bringing the contact points together momentarily. E is a compound spring, the straight member of which carries the movable contact, while the stationary contact F is mounted opposite it. The second member of this compound spring is curved at its end to engage the straight member. Ordinarily the straight spring blade is held under the tension of the curved blade and the contact points are held apart. When the curved blade is struck by the hammer D the points come into contact with each other. The curved blade, however, is thrown over farther by the impact and its hook leaves the straight blade. Upon reaching the limit of its movement, it flies back and strikes the end of the straight blade a blow, causing a very sharp break of the circuit. This movement is so extremely rapid that it cannot be detected by the unaided eye, so that its working cannot be tested simply by watching the operation of the contacts as in the case of a magneto interrupter. B, C and D of Fig. 334 show the successive movements of the parts during a single cycle. In A a notch of the ratchet has engaged B and is drawing it against the tension of the spring C. In the second sketch, B, the hook is just being released; in C the lifter is riding back over the rounded portion of the ratchet and is striking the hammer D, which in turn pushes E for a brief instant against F. The return of B to the position shown in sketch D is so rapid that the eye cannot follow the movement of the parts D and E, which to all appearances remain stationary.

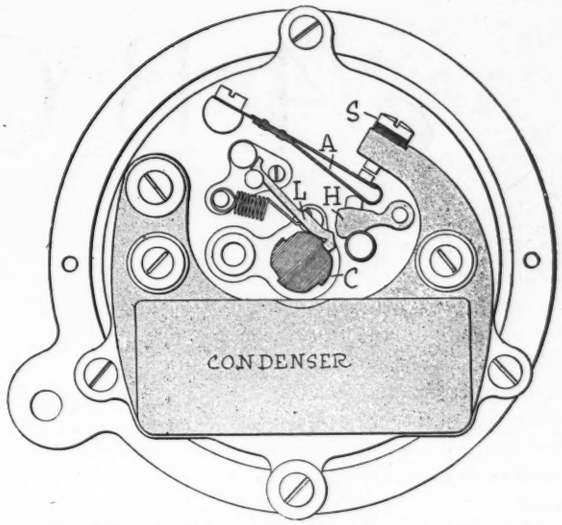


Fig. 335—Location of condenser in Atwater-Kent open-circuit breaker

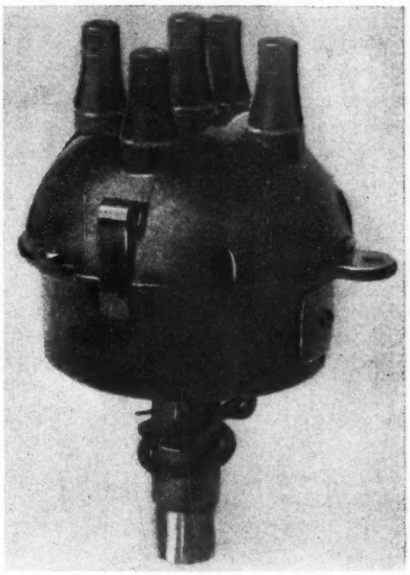


Fig. 336—Complete Atwater-Kent timer-distributor unit for K3 systems

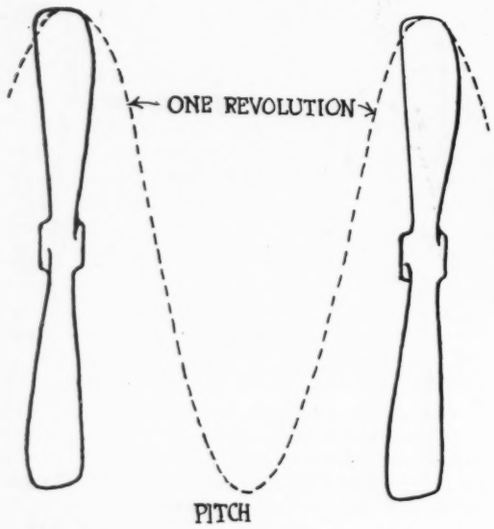
Adjustment of the contact points is made by removing one of the three washers from under the head of the contact screw F, and the gap should be .010 to .012 inch, never exceeding the latter. Where more accurate means of determining this distance are not available, it may be gaged with a piece of manila wrapping paper, which should be perfectly smooth. With the aid of a micrometer, a sheet of paper of the proper thickness can be selected. The contact points are of tungsten, and as the moving parts are all of glass-hard steel very accurately machined, the wear is negligible, so that adjustment is not required oftener than once in perhaps 10,000 miles and a replacement of contact points after running perhaps 50,000 miles.

In the latest models of this K3 type of ignition system, the condenser is located within the timer-distributer unit and in very close proximity to the contacts. The location of the condenser is shown in Fig. 335, and the complete timer distributer unit is shown in Fig. 336. This arrangement permits a reduction in the size of the condenser and at the same time increases its effectiveness. An automatic spark-advance mechanism is provided, which operates by centrifugal force, and this automatically advances the time at which the circuit is made and broken to compensate for the increase in speed.

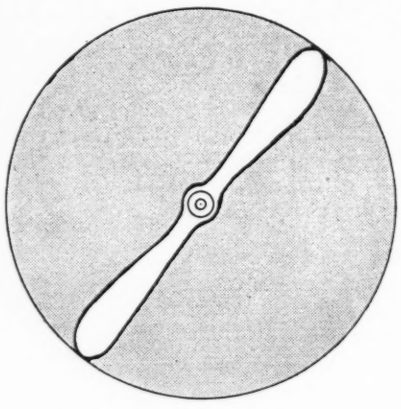
A. B. C. of Aviation

ONE of the most important elements of an airplane is the propeller, which transforms the energy of the engine into a forward thrust. Support in an airplane, or the power to resist the pull of the earth, is dependant upon a speed and the latter in turn is dependent upon thrust, which must be furnished by the propeller.

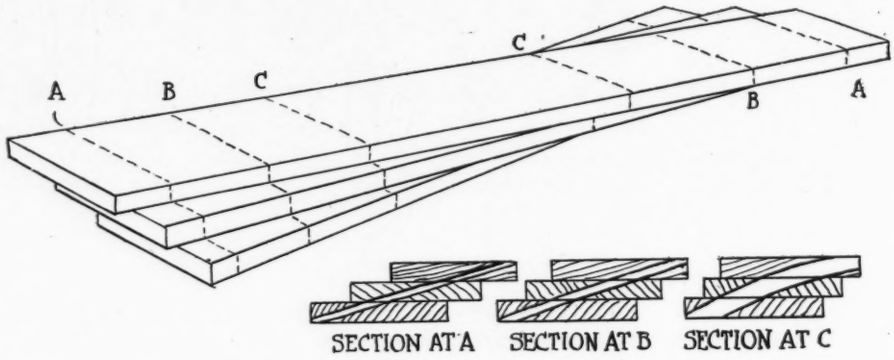
The pitch of a propeller is the distance it moves forward during one complete revolution. It is based upon the screw thread principle. In other words, when a nut on a bolt is turned one complete revolution on the threads, it moves forward a certain distance and every succeeding revolution will move it forward the same distance. The same is true of an airplane propeller, only in this case there is a certain amount of slip, because the air is not a solid substance like the nut or bolt. Hence the pitch of a propeller is purely a theoretical measurement.

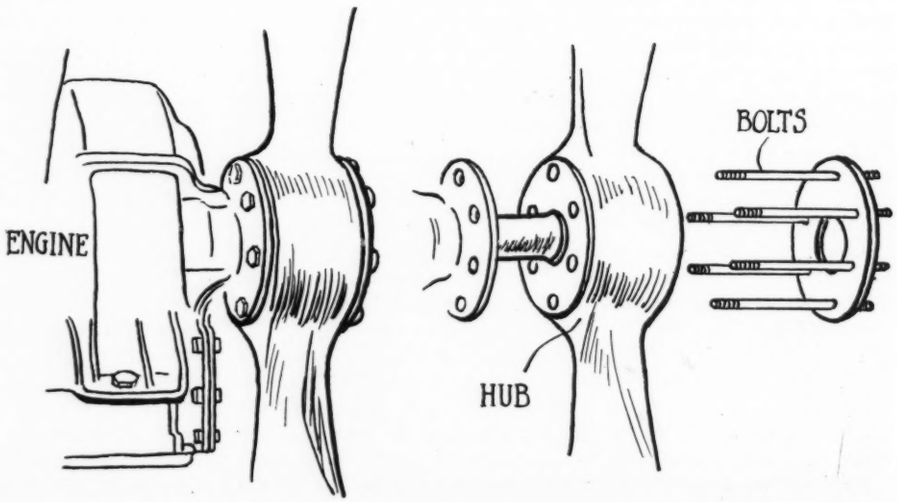


The shaded portion of the circle in the illustration, called the disk area, is the effective area influenced by the propeller. In other words, the air acted upon by the propeller is limited to that which flows through the circle swept by the tips of the blades. This amount increases, therefore, with the diameter of the propeller.

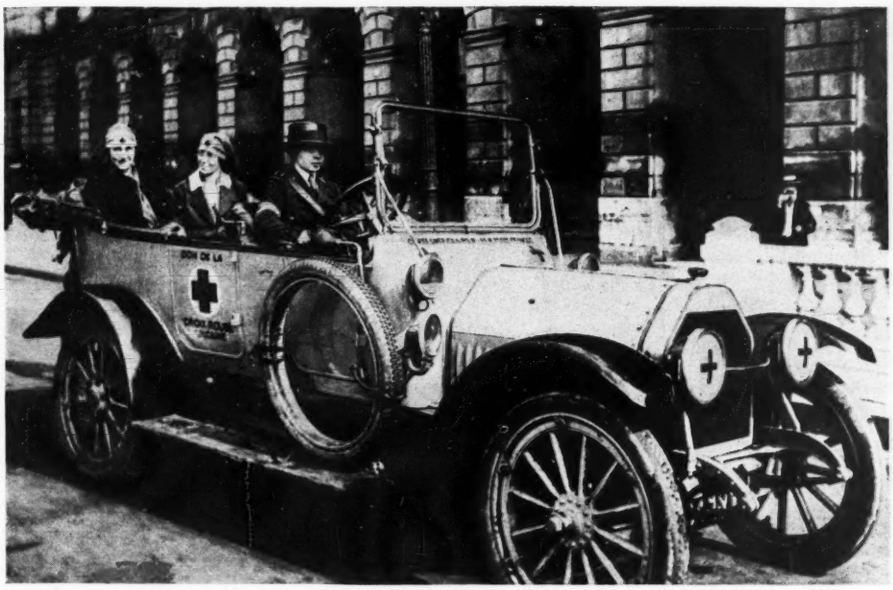


Nearly all of the propellers nowadays are made by gluing up a number of boards under pressure and then cutting or whittling them out by hand. This is called a laminated construction and the different layers of wood are spoken of as laminations. The illustration for sake of clarity shows only three laminations, but usually there are more. These may be of one kind of wood or alternate layers of spruce, ash, maple and other hard woods. A hole is drilled in the center of the planks which corresponds to the hole in the hub of the finished propeller. The superfluous wood is cut away and templates and gages frequently applied to see that too much material is not cut away. This also helps to get both blades exactly alike. The finished propeller is given a coat of varnish and polished. It is attached to the engine crankshaft by clamping the hub between two steel plates or disks and held in place by bolts which pass through the wood of the hub and the disks.





Women in the World War



These Red Cross nurses are American women, and the driver is a French woman. It is not at all unusual to see the women in France acting as chauffeurs. They do so even for American cars

TWO distinct national organizations are preparing women to render whatever motor service is necessary. In fact, both organizations are lending their women to service in the mobilization of the country's soldiers at the various cantonments, training camps and stations. One of these organizations is the National League for Woman's Service, the motor division of which has in charge the training of many hundreds of women as efficient motor car drivers. The other is the Navy League, which is teaching women to make their patriotism efficient in motor as well as in other ways.

These two are represented all over the country, and especially effective are their organizations in the larger cities, such as New York and Chicago and the capital, Washington. From New York to San Francisco and from St. Paul to New Orleans women who drive cars or aspire to drive them are uniting and giving their time and efforts to any duty that develops. They give their cars and service to the recruiting stations and training stations alike. Women who have never gone out in a car before without a chauffeur have learned to handle the car quickly and without accident in city traffic as well as on the open road.

It is estimated that so far 37 per cent of the women who have registered in the various states which have gone through that ceremony have expressed their preference for service as being motor service. More than this percentage is represented among the women of certain localities, where organized recruiting stations that reach a larger part of the population are.

The model unit for motor service for women was organized in New York by the national chairman of the motor division of the National League, Captain Helen Bastedo. The women of this unit wear khaki uniforms, visored caps and leather leggings. There are 125 of them who are active members and 300 enrolled who will give their services when the need arises. Forty states, however, have motor organizations that are affiliated with the national division, and almost daily new units spring up.

The ideal woman driver in the motor service called forth by the war reports for duty by 8.30 in the morning, drills twice a week in infantry formation and army calisthenics, spends half a day once a week in clinical work at the hospital; attends regular classes in signaling and is ready at all times to work.

The Navy League has been active in motor organization since the declaration of war.

Carry President's Message

The first transcontinental motor car run to be authorized by the United States government is being made by two women. It is not necessarily a war run, but the results of the trip across country more than likely will prove of military value.

Mrs. Rowe Fulkerson and Miss Loella Littlepage, both of Washington, D. C., are now on their way to California. The start was made from the war department, and they carry messages from President Woodrow Wilson and other men of the Capital to the governor of California. A Saxon six car is being used, and during the first stage of the journey, from Washington to Staunton, Va., it was driven by Mrs. Fulkerson.

Try This on Your Stove

The Chicago Housewives' League has offered to the public a recipe for a new cheap bread made from Red Dog flour, which costs about half as much as white flour and is said to be more nutritious. It is:

1 pt. water or milk.
2 tsp. salt.
2 tbsp. sugar.
2 tbsp. fat.
3 cups white flour.
About 3½ cups Red Dog flour.
¼ cake dry yeast soaked in ¼ cup water or milk 20 min.

Pour hot water over the sugar, salt and fat and allow to cool until lukewarm. Add yeast and white flour. Beat well and let stand in warm place over night. Early in the morning knead for 10 or 15 min. into stiff dough with Red Dog flour. Let it rise in a covered bowl until the dough doubles in size. Shape into loaves, let rise again and bake from 45 min. to an hour.

Buenos Aires Girls Drive

The women of England and the United States at last have introduced the custom of driving motor cars into Buenos Aires. Only within the last year have women driven their own cars there. Two or three English and American girls insisted on doing it in spite of customs, and Argentine women have taken it up. Now 100 of them drive. To obtain a permit to drive a car the Argentine girl or woman must pass the same examination as that given to public drivers, both as to the repair and control of the car.

So far the women have proved more careful drivers than the men in Buenos Aires. Not a single accident has been caused by a car driven by a woman there so far.

The Owner's Garage

HERE is a very attractive garage designed in the English half-timbered effect. The broad expanse of red tiled roof would be a most pleasing contrast to the surrounding green foliage. It is not an inexpensive garage to build, however, but one that would warrant the outlay both in satisfactory appearance and utility. There is room for any car, with ample working space around. The work bench with drawers for tools and accessories underneath and plenty of light above is a luxury to anyone fond of tinkering around his car.

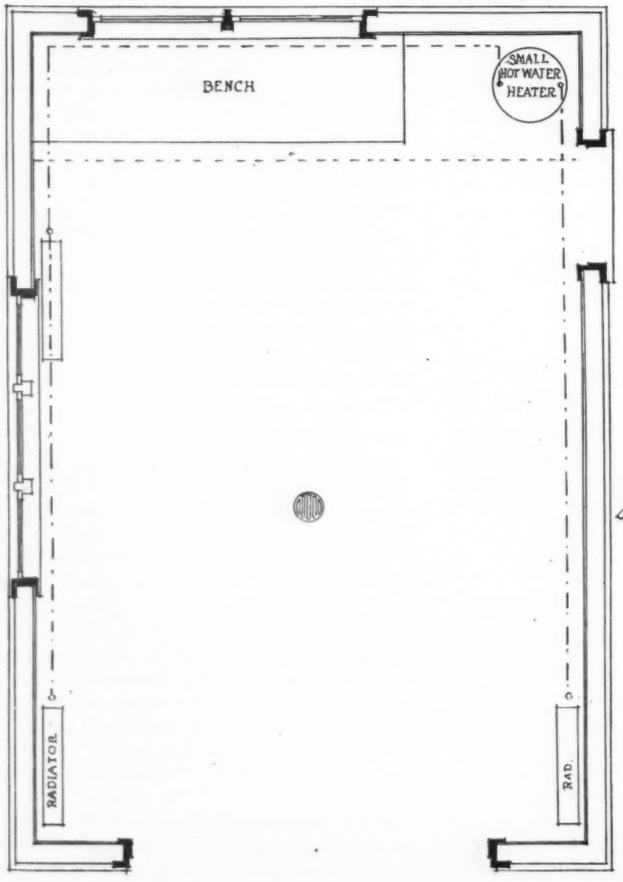
Raising the foundation above the floor line to form a concrete base insures the dry floor and the sills against rotting.

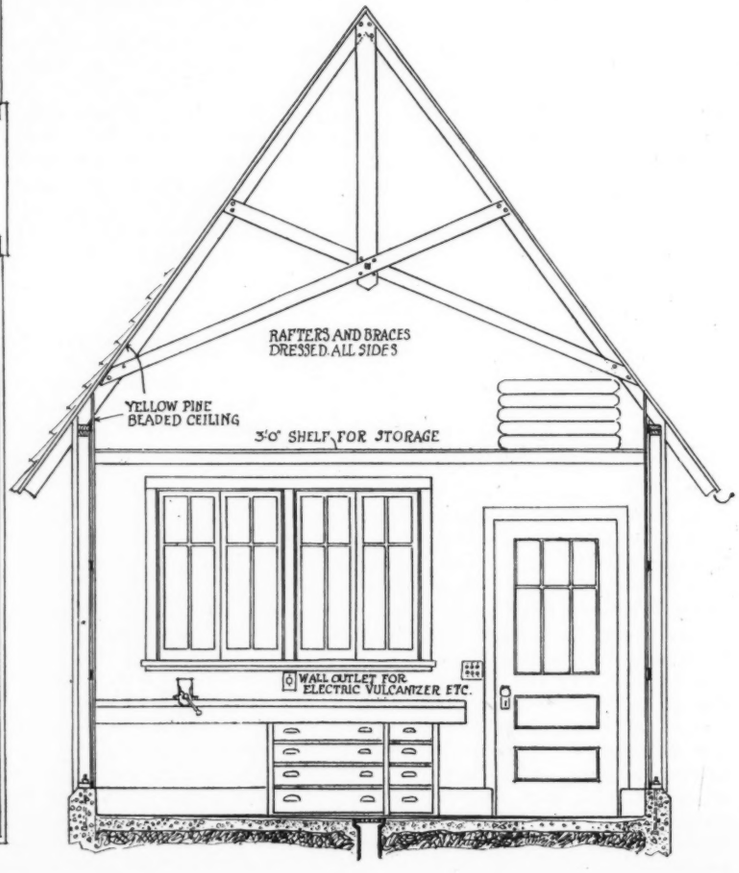
The interior finish of this garage can be made very attractive by staining the beaded ceiling a pleasing tint. The electric wiring should be in a conduit, or BX, and installed before the ceiling is done.

Provisions are made for heating, though this is not worked out in detail as to the manner of dimensions, for instance. However, if you will follow the garage designs published from time to time, you will be able to arrange your garage-heating system for the winter in detail and satisfactorily, both from a matter of cost and efficiency.

This garage is designed by Tom Wilder

This garage would look well on most any country site. Nestled among the trees of a wooded lot, it would be most attractive




RAFTERS AND BRACES DRESSED ALL SIDES
YELLOW PINE BEADED CEILING
3'-0" SHELF FOR STORAGE
WALL OUTLET FOR ELECTRIC VULCANIZER ETC.

The Motor Car Repair Shop

Attention to Details Prolongs Life of Car

TAKING the proper care of a car is just as important as the driving of it, in fact, more so, for if a car is not kept at concert pitch, it will not handle well, no matter how experienced the driver is. After all, caring for a motor car is more or less simply a question of proper oiling of the parts and cleaning them. Adjustment of worn parts will be minimized if, in the first place, parts are kept lubricated.

About every 1000 miles the rear axle should be examined and filled up with lubricant if necessary. If oil or grease leaks on the brake drums, it is an indication that there is too much lubricant in the housing or that the felt washers need replacing. It sometimes happens that oil or grease works down the drive shaft tube to the differential housing, filling it too full. At the close of the season if the car is to be laid up for the winter, the axle should be flushed out with kerosene and refilled with fresh oil, providing that the axle is not to be taken down for adjustment and cleaning. If the owner has facilities for doing the work, it is advisable to take apart the rear axle and clean it thoroughly, at the same time going over it to see if there are any bearings, etc., that need replacing. You cannot tell the condition of these parts by looking at the outside of the axle housing.

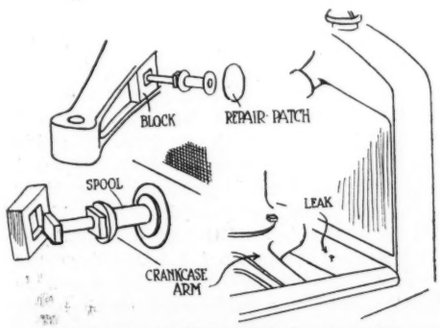
Care must be taken not to damage the gasket placed between the cylinder head and block when the head is lifted off for removing carbon or grinding the valves. Leakage of compression or jacket water to the cylinders depends upon this gasket. The first step in removing the cylinder head is to drain off all the water in the radiator. In some cases the water outlet connection is a part of the head, so the hose connection must be removed also. If a flange connection is used, it is only necessary to take out the bolts holding the joint. After all of the holding down bolts have been removed, the head can be lifted off. There may be a tendency for it to stick, in which case it is not advisable to coax it with a sharp tool by prying, as the gasket may suffer. A better way is to tap the head lightly with a lead or wood mallet. If the head is a heavy one, it can be lifted off by standing above the engine with one foot on the right hood board and the other foot on the left. This will allow a straight upward pull on the head.

If the car has a cone clutch faced with leather, the latter should be dressed two or three times in the first 500 miles with Neatsfoot oil, and afterward whenever it shows signs of grabbing or slip. Multiple disk clutches should be washed out with kerosene about every 1800 miles and fresh lubricant put in, unless they are of the dry-plate type.

Roadside Repairs

The lower tank of a radiator had sprung a leak at a point opposite one of the engine crankcase arms and the water was coming out in a small, steady stream. It looked like a bad case for several minutes and as there was nothing in the tool box with which to make the necessary repairs, the driver took recourse to the nearest farmhouse. No soldering apparatus was available, so it was decided to fix the leak temporarily in the following way:

A block of wood was shaped to fit the crankcase arm and a square hole cut in it to fit the head of a machine bolt. A common spool was slipped over the bolt after the nut had been run on first. A rubber patch used for inner tubes was then placed over the leak and the bolt with the nut and spoon on it placed so that its head rested in the hole cut in the block, as shown in the illustration. By bringing the end of the spool up against the patch and backing off the nut on the threads of the bolt, the spool was jammed tightly against the patch, holding the latter firmly.



To repair a radiator leak temporarily

Measuring Grades

Many motorists are of the opinion that grades are measured in degrees. This is not the case, for they are measured in per cent. That is, the per cent grade is the rise per unit of length, the latter measured on a line which is horizontal with reference to the slope. For example, in the illustration the slanting lines represent grades and let us presume that the line AB is 1000 ft. long. If the point D on the vertical line BC is 500 ft. above B, it would be spoken of as a 50 per cent grade because the distance BD is just one-half that of the line AB. A 33⅓ per cent grade would be one in which there was a rise of 1 ft. for every 3 measured horizontally on the line AB. A 100 per cent grade is one in which the rise or distance BC is equal to AB, but the angle in this case is 45 deg. and not 90 deg.

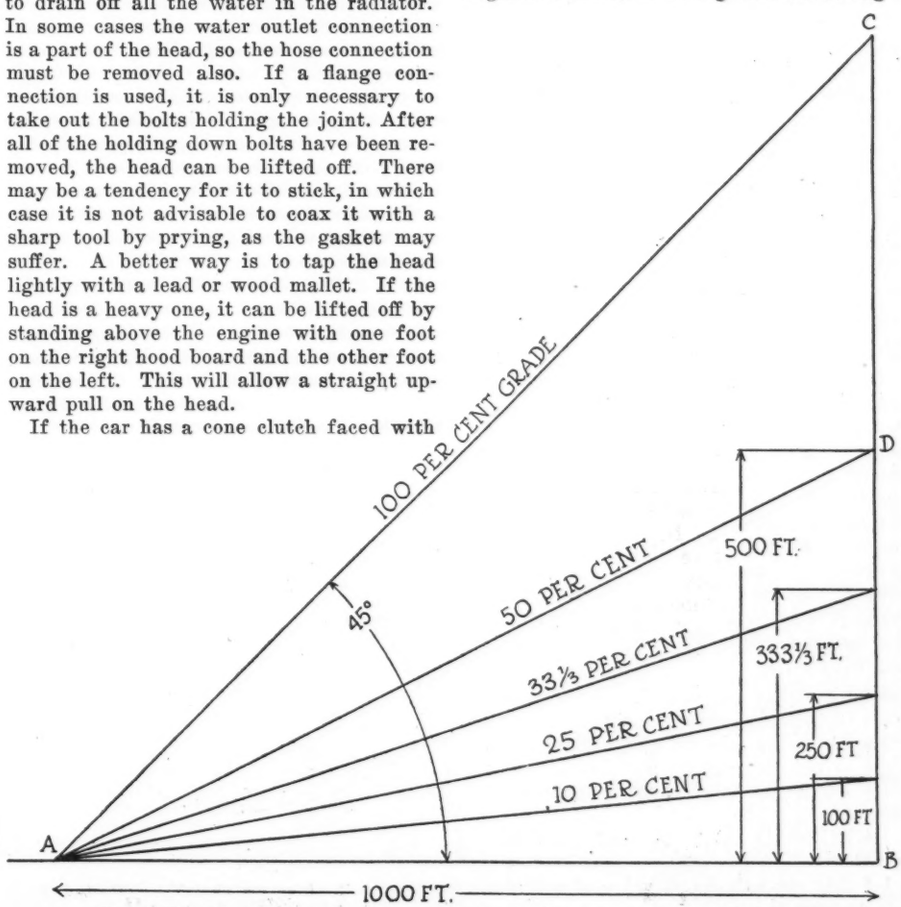


Illustration of proper method of measuring grades in per cent—not in degrees

The Readers' Clearing House

Mile-A-Minute Ford Built on Motor Age Suggestions

EDITOR MOTOR AGE—Herewith is a photograph of a super-Ford which is one of the fastest cars in the South. In making this car we got all our ideas from MOTOR AGE and if we had not used your ideas we would not have had the car that we have. It will attain a speed of 65 to 70 miles an hour. We built this car, body and all accessories, labor, material, for about $400, using an old motor that cost $100.—J. C. Jetton, Nashville, Tenn.

Valve Timing

How to Time Overland 75 Valve

Q—My model 75, 1917 Overland has lost considerable power since overhauling. The valves have a space of four times the thickness of magazine paper. It is equipped with a Tillotson carbureter No. 275, model 75. How high should gasoline rise in the float chamber? The reed springs look as if burnt. I have adjusted the carbureter several times without better results. What is the trouble? Considerable oil leaks past the piston.

2—In timing valves, where is the mark to correspond to the marks on the fly wheel?

3—When going downhill with the spark on and gas retarded, several explosions occur in the muffler and the engine doesn't miss when pulling.—Ralph L. York, North Powder, Ore.

1-2-3—From your questions it would appear that the engine was not properly timed upon reassembling. An engine that is not timed correctly will always lack power, which is easily mistaken for carbureter trouble. We advise that you leave the carbureter alone for the present and check up on the valve timing. All of the symptoms you mention are to be associated with an improperly timed engine. To time the engine proceed as follows: The rim of the flywheel bears at various points the following marks:

1-4 UP means: pistons of cylinders 1 and 4 are in their uppermost position.

2-3 UP means: pistons of cylinders 2 and 3 are in their uppermost position.

1-4 I-O means inlet valve of cylinder 1 or 4 opens.

1-4 I-C means inlet valve of cylinder 1 or 4 closes.

1-4 E-O means exhaust valve of cylinder 1 or 4 opens.

1-4 E-C means exhaust valve of cylinder 1 or 4 closes.

2-3 I-O means inlet valve of cylinder 2 or 3 opens.

2-3 I-C means inlet valve of cylinder 2 or 3 closes.

2-3 E-O means exhaust valve of cylinder 2 or 3 opens.

2-3 E-C means exhaust valve of cylinder 2 or 3 closes.

The engine cylinders are numbered, No. 1 being the cylinder near the radiator, and No. 4 the nearest to the dash.

Cylinder No. 1 fires first, No. 3 next, then No. 4 and the next No. 2.

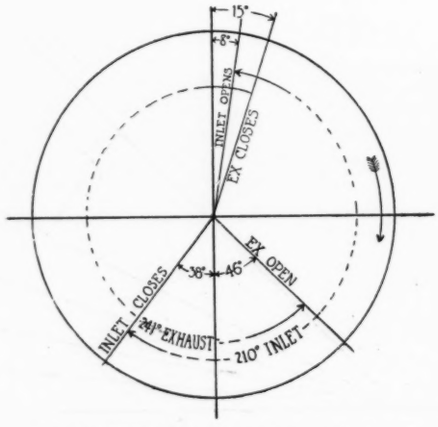


Fig. 2—Diagram showing method of timing Overland valves

The timing of the valves is perhaps best understood by the reference to Fig. 2. It will be seen that the intake valve opens when the flywheel is 8 deg. past upper dead center and closes when it is 38 deg. past the lower dead center. The exhaust valve opens 46 deg. before the lower dead center and closes again 15 deg. past upper dead center; thus the inlet valve opens and closes late, whereas the exhaust valve opens early and closes late.

The flywheel being 14⅛ in. in diameter, the following table gives the measurements in inches, of the valve operation when laid out on the rim of the flywheel.

Diameter of flywheel, 14⅛ in.
Inlet valve opens late, $\frac{63}{64}$ in.
Inlet valve closes late, $4\frac{11}{16}$ in.
Exhaust valve opens early, $4\frac{43}{64}$ in.
Exhaust valve closes late, $1\frac{13}{16}$ in.

To determine whether setting of the valves is correct, proceed as follows, beginning with cylinder No. 1. Open the priming cups over all exhaust valves, to make the turning of the flywheel easier. Turn the flywheel to the left until the mark 1-4 UP is in line with the punched guide mark on the cross member. Now pistons 1 and 4 are at their highest points in their cylinders, or on upper dead center. About 1¼ in. to the right of the mark 1-4 UP you will notice the mark 1-4 I-O. Turn the flywheel to the left until this mark is lined up with the guide mark on the cross member.

At this point the inlet valve of either cylinder 1 or cylinder 4 should begin to lift. If the lift should occur in cylinder 4 turn the flywheel one complete revolution, until the mark 1-4 I-O again appears on top and in line with the guide mark. Now watch or feel the inlet-valve stem of cylinder 1; it should just begin to lift from its seat.

To determine from the closing point of the same inlet valve, turn the flywheel a little more than a half revolution, until the mark 1-4 I-C appears on top. With the flywheel in this position, the inlet valve should be closed and there should be just enough space between the top of the valve-lifter and the top of the valve stem that a piece of newspaper can be placed between them. At the factory stem and lifter are set so that the distance between them is exactly 0.003 in. This clearance is necessary to compensate for the expansion of the valve stem when it becomes hot during the operation of the engine.

If adjustment is necessary, loosen the lock-nut on the valve stem and screw the adjusting nut up or down, as required. If the play between the valve lifter and valve stem is too great, the result will be noisy operation; if the adjustment is too close, the valve may be prevented from seating fully.

Next, test the exhaust valve, again bringing 1-4 UP to the top and turning the flywheel to the left until the mark 1-4 E-C appear in line with the guide. After you have tested the closing of the exhaust valve of cylinder number 1, test its opening by revolving the flywheel until the mark 1-4 E-O comes to the top. Then go carefully over the valves of cylinder No. 4, and of Nos. 2 and 3.

A slight variation of the flywheel markings to the right or left of the guide mark is permissible, but it should not be greater than ¼ in.

Timing a 1913 Little

Q.—Are the gears from the crankshaft, camshaft and magneto marked so they can be set right on a 1913 Little roadster?—E. O. Skogerson, Northfield, Minn.

Usually every maker places marks of some kind on the gears of the engine so that when the latter is taken down it can be correctly re-assembled in regard to the timing. If they are not and you have disconnected all of the parts you can proceed as follows: The first thing to do is to get the magneto ready. Remove the distributer cover and the breaker box cover and place the breaker box in the retarded position. If you do not know what position this is, imagine the magneto installed in the engine and then move the spark lever in the retarded position, noting the direction in which the breaker box moves. Usually the breaker box is shifted counter-clockwise for the retarded position. Grasp the end of the armature shaft and turn it around until the distributer arm is on segment No. 1. There is a mark just above this segment or near the wire leading from it. With the

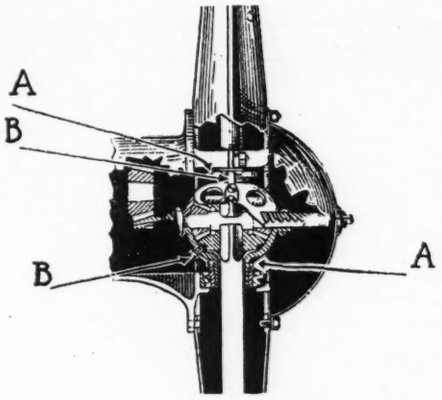


Fig. 3—Parts that need adjustment on Overland axle

distributer arm still on this segment turn the shaft backward and forward slightly, at the same time watching the breaker points. You will notice that at some time during the movement of the distributer arm across the segment the breaker points will open. The object is to get the arm on the segment and the points just about to open. To do this turn the armature around until the points are wide open and then turn the shaft backwards until the joints just come together. Now, if the magneto were installed in position on the engine it would deliver a spark to cylinder No. 1. The next step is to get No. 1 cylinder ready to receive the spark.

If the engine happens to be a T-head with a pet cock in the center, the work is comparatively easy, but your engine is an L-head type and it is a little more difficult. Open the pet cock and place your finger over it to feel the compression. Now turn over the engine slowly until you feel the compression in cylinder No. 1 and let the gas escape gradually. When the gas has ceased escaping the piston is at or near the top dead center. Another method is to watch the valves and flywheel, if the latter is marked. Usually a mark such as TC 1 & 4 appears on the flywheel, which means that pistons 1 and 4 are on top dead center. This mark should line up with a mark on the cylinder casting, and when this is done, both intake and exhaust valves of that cylinder should be closed. You can tell if they are closed if you can rotate the tappets underneath the valve stems. With both valves closed and the piston on top dead compression center, slip the magneto in place, or the intermediate timing gear if it only has been removed. The engine will then be correctly timed.

To check up on the valve timing, that is, to see whether or not the camshaft is in the correct relation to the crankshaft, turn the engine over so that the piston of No. 1 cylinder is on top compression dead center and note whether the magneto distributer arm is on segment No. 1. This is the condition of things when the cylinder is about to fire. The camshaft should then be slipped in place so that both intake and exhaust valves will be fully closed. As a rule it is better to time the valves first and then turn to the magneto timing.

TO assist readers in obtaining as a unit all information contained in this department on a certain subject in which they may be most interested, such as ignition, carburetion, etc., MOTOR AGE has inaugurated the segregation of inquiries into classes of allied nature. Questions pertaining to cooling will be answered under that head and so on.

VALVE TIMING

Ralph L. York.....North Powder, Ore.
E. O. Skogerson.....Northfield, Minn.

CARBURETION

Chas. L. Hetherington..Bentlyville, Pa.
G. H. Barringer.....Los Angeles, Cal.

THE ELECTRIC SYSTEM

Leroy Markham.....Bangor, Mich.
A. Milton Burnett.....Miami, Ariz.
W. R. McQuigg.....Wooster, Ohio
William Gilbert.....Pueblo, Col.

MISCELLANEOUS

T. T. Benyon.....San Antonio, Tex.
Bethel P. Brown.....Henderson, Ky.
L. F. Sevier.....Denver, Col.
Leroy Markham.....Bangor, Mich.
C. Harvey Byers.....Lewistown, Pa.
Walter M. Tate.....Hoberg, Kan.

REBUILDING

Paul A. Hof.....St. Louis, Mo.
T. T. Benyon.....San Antonio, Tex.
L. Y. Sullivan.....Liberal, Kan.

LUBRICATION

E. Paul Dupont.....Wilmington, Del.

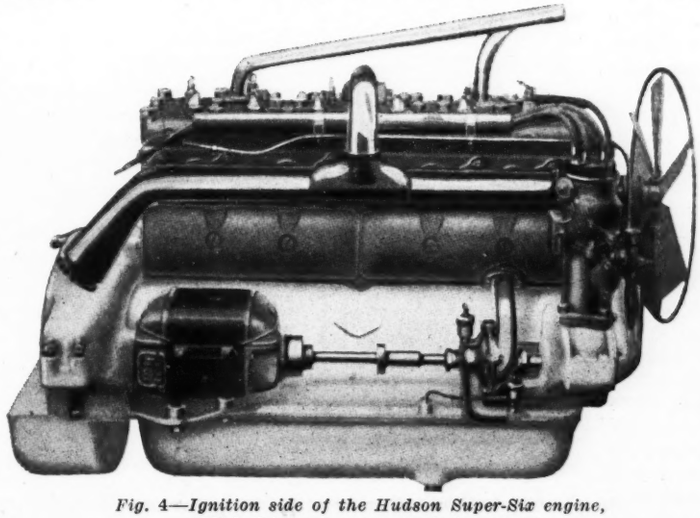


Fig. 4—Ignition side of the Hudson Super-Six engine, published in response to reader's request

Miscellaneous

Wants Picture of Hudson Engine

Q.—Publish a sketch showing ignition side of the Hudson engine.—T. T. Beynon, San Antonio, Tex.

The ignition side of the Hudson Super-Six engine is shown in Fig. 4.

Overland Has Noisy Gears

Q.—The gears of my 75, 1917 Overland make a great deal of noise. Show a diagram of their adjustment.—Ralph York, North Powder, Ore.

We presume that you mean the rear axle drive pinion and ring gear are in need of adjustment. When it becomes necessary to adjust the mesh of the large bevel gear and the drive pinion this is done as follows: Loosen the lock on the adjusting collar on each side of the differential and turn the adjusting collar on the side toward which the differential is to be moved, toward the differential. Set the gears as de-

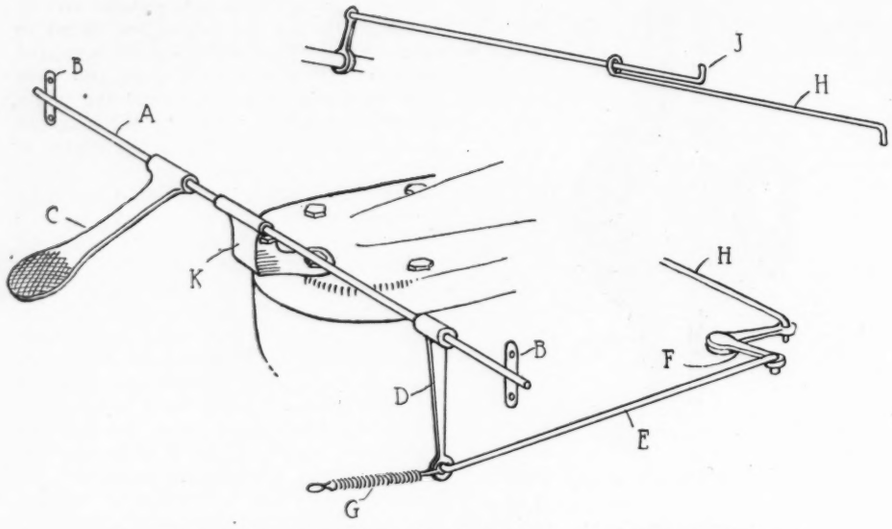


Fig. 5—Suggestion for making a home-made foot accelerator for Ford cars

sired and then screw both adjusting collars out against the bearing so that the differential is held firmly in place. The right hand collar should be backed off two notches. Be sure that the adjusting collars are locked in place after the adjustment has been made. In Fig. 3 are shown the locations of the various adjusting devices in this axle. In this illustration A shows the adjusting collars and B the adjusting collar locks.

Sphinx no Longer Made

Q—Is the Sphinx Motor Co. of York, Pa., still manufacturing cars? State the list price of the cars they manufactured.

The plant of this concern was taken over some time ago by the Victor Motor Co., York, Pa. The Sphinx car of 1915 in both touring and roadster models sold for $695. In 1916 the concern made a five-passenger touring car that sold for $640. The same car was made for a time in 1917 and listed at $675. The horsepower of all three models was the same, namely 28 hp.

Muffler and Accelerator for Ford

Q—I have a larger silencer than the one on a Ford. If I put it on a Ford would it quiet the exhaust any?

2—Publish a drawing of a home-made accelerator giving length and width of each part.—Bethel P. Brown, Henderson, Ky.

1—There is no reason why you should not get good results from the larger muffler. Sometimes mufflers are not sufficiently large enough to expel the burnt gases as fast as desired and consequent heating of the engine is the result. A larger muffler is a good thing providing it is properly designed and does not produce too much back pressure.

2—A suggestion for constructing an accelerator for the Ford car is shown in Fig. 5. No dimensions are given in the illustration, but it will not be hard for the average owner to get these from noting the general construction of the device and measuring up the space on the car where the various units are to be installed. The part A is a piece of $\frac{3}{16}$-in. Bessemer rod extending across the dash on the engine side, and is supported at each end by brackets B screwed to the dash. The foot pedal C is fastened to the rod with a small steel pin. The same thing is true of the lever D which actuates the throttle arm of the carbureter through the rod E. An auxiliary arm F is soldered or fastened in some other manner to the regular Ford throttle lever on the carbureter and placed at about right angles to it. Make the rod E of such a length that when the throttle is closed the foot pedal C will be raised from the foot board, so that a downward pressure upon C will open the throttle. The spring G holds the throttle normally in a closed position or to whatever position the hand throttle is set. In order to make the hand throttle independent from the foot throttle, the rod H must be adjustable. This can be done by removing the present rod going between the cylinders to the steering post lever and cutting it off a little and bending up the end as shown at J. Then form an eye in the end of the rod H and bend it up at right angles. The rod from the steering post lever slides in the eye and when the throttle is entirely closed, the end J should be up against the eye. Then when the hand throttle is opened, the rod H will be pulled accordingly and the engine speeded up. If the hand throttle is set at a certain point, any additional opening can be secured by pressing the foot pedal C. In this case the rod H will simply slide along on the other rod without disturbing the position originally set by the hand throttle on the steering wheel. When the foot is taken off the pedal C the carbureter throttle levers will come back to the original setting. Naturally when the hand throttle is used, the foot pedal will be moved downward. In order that the shaft A will not be sprung when pressure is applied to the foot pedal, it is advisable to fit a metal support K for it which can be bolted in place by using the two rear cylinder heads holding down bolts.

Car Pitches on Rough Roads

Q—My 1915 Dodge pitches badly on a bumpy road. Would snubbers on the front end remedy this?—L. F. Sevier, Denver, Colo.

We know that many Dodge owners are having very good success by equipping their cars with snubbers. It probably would be better to fit them all around, however, inasmuch as the trouble will be only partly remedied by placing them on the front axle and frame only.

Chauffeur's Age Limit in Kentucky

Q—What age must a chauffeur be before applying for license in Kentucky?—Bethel P. Brown, Henderson, Ky.

No mention is made of the age of the applicant in the administrative provisions which went into force Jan. 1, 1917, effecting motor vehicle registrations, licenses and revenues. The only stipulation made is that the applicant for a chauffeur's license in Kentucky pass a successful examination.

Repair Parts for Cornelian

Q—Who furnishes repairs for the Cornelian made by the Blood Bros. Machine Co., Allegan, Mich.?—Leroy Markham, Bangor, Mich.

Repair parts for this car can be obtained from the former maker by writing to the address you give.

Drivers' License Requirements

Q—What are the qualifications of a licensed driver in Pennsylvania?—C. Harvey Byers, Lewistown, Pa.

According to the administrative provisions that went into effect Jan. 1, 1917, the applicant for a chauffeur's license in the state of Pennsylvania must furnish affidavits as to his competency. No mention

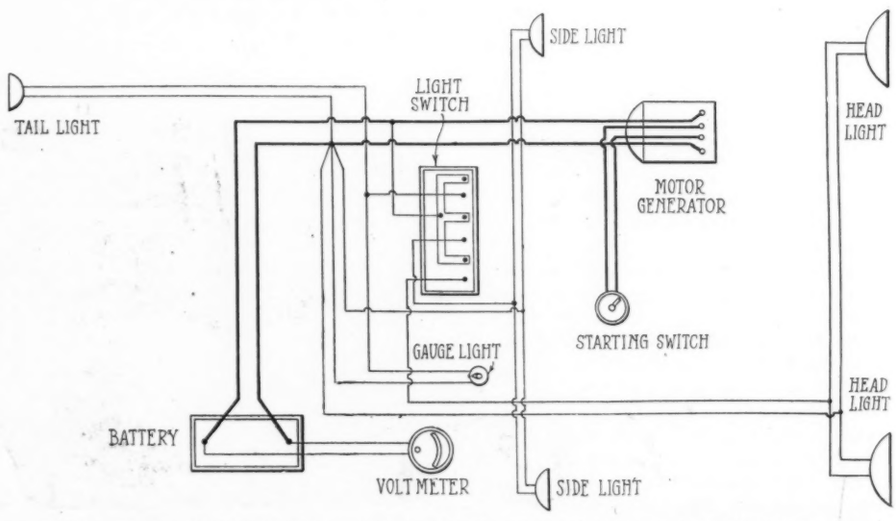


Fig. 6—Wiring diagram of the North-East electric system as used on the 1914 Marmon car, showing manner of connecting ammeter

is made of the age limit. Chauffeurs' licenses are issued Jan. 1, according to law.

The Electric System

Connecting Generator to Battery

Q—Show wiring diagram for hooking on a generator through an ammeter to the storage battery and cutout.

2—Explain if the generator for an Overland model 75 which has Auto-Lite generator has a shifting brush on to regulate the charge going into the battery like the Hudson Super-Six. This car when running about 8 m.p.h will not generate at all and the batteries run down because the driver starts so many times.—Leroy Markham, Bangor, Mich.

1—A diagram showing the connections between the various units is shown in Fig. 8.

2—The output of the generator is controlled by the windings of the machine itself. This control is automatic, consisting of a reversed series winding which cuts down current production at the proper point by the simple method of weakening the magnetic power of the field.

The generator begins to produce current at a car speed of about 7½ m.p.h., and the production climbs until at about 20 m.p.h. the generator is producing its maximum output of 14 amp. At this point the reversed series coil holds the output, no matter how fast you may drive. Ten amperes, or an abundance of current for both lighting and charging, is produced at a car speed of about 15 m.p.h.

The generator should be examined occasionally to see that the connections are tight and that there is no undue wear on the moving parts. The commutator end of the generator is accessible by removing the end plate. If the commutator should be found blackened or rough it may be smoothed down with No. 00 sandpaper while the generator is revolving. Do not use emery cloth. After smoothing the commutator examine it carefully and remove all particles of metal that may bridge across the insulation between the copper segments. Also blow out any carbon dust that may have accumulated in the lower part of the generator case.

See that there is just enough spring tension on the brushes to insure good contact on the commutator—too much tension will cause unnecessary heating and wear of the commutator and brushes. Keep the commutator and brush chamber free from dirt and grease. When inserting brushes see that the whole end of the brush is in contact with the commutator surface. Both of the brush holders must be entirely insulated from the generator case. If any of the insulating plates, bushings or washers are found inoperative they must be replaced with new ones.

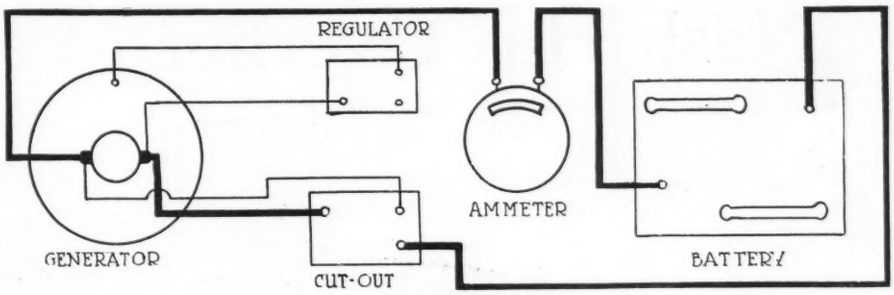


Fig. 8—Diagram showing manner of connecting a generator through an ammeter to the storage battery and cut-out

Ammeter on 1914 Marmon

Q.—Illustrate manner of wiring an ammeter on a 1914 six-cylinder Marmon, Northeastern single unit.—A. Milton Burnett, Miami, Ariz.

The general layout for the wiring of the Northeast electrical system such as was used on the Marmon car of 1914 together with the method of connecting the ammeter is shown in Fig. 6.

Use of Wagner System

Q.—Is the Wagner starting and lighting equipment as standard as the Auto-Lite?—W. R. McQuigg, Wooster, Ohio.

According to the statistics we have there are four makers using the Wagner system and eight who use the Auto-Lite. The former is used on the Moline, Scripps-Booth, Elgin and Studebaker. The following use the Auto-Lite: Abbott-Detroit, Case, Chevrolet, Detroiter, Empire, Jackson, Monroe, Overland, Willys-Knight. These figures apply to the 1917 models. The Overland and Willys-Knight are made by the same concern, hence they are counted as one.

Ammeter on 1914 Buick

Q.—Publish wiring diagram showing how to connect an ammeter to show the charge and discharge on a 1914 Buick, B-55.—William Gilbert, Pueblo, Colo.

This is shown in Fig. 7.

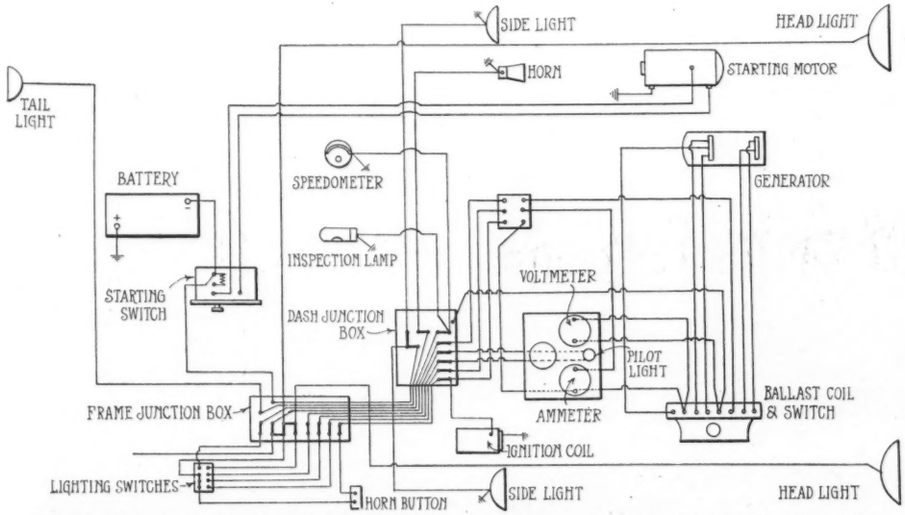


Fig. 7—Layout of the 1914 Buick lighting system, showing how an ammeter is connected to show charge and discharge

Carburetion

Q.—My 1911 Cadillac is equipped with a Schebler Model L carbureter. Would it be of any advantage to put one of the later model carbureters on?

2—What mileage per gallon should this car give if everything is in good order?—Chas. L. Hetherington, Bentleyville, Pa.

In view of the fact that your present carbureter is an old type of instrument and not fully capable of handling the present day low grade of fuel, it probably would pay you to install a more modern type. Carbureter manufacturers have made wonderful strides in the last few years in the way of perfecting their products, especially in making them efficient to cope with the fuel now obtainable. The older types of instruments were satisfactory at that time, but hardly could be expected to be efficient now.

2—If, by having everything in good shape, you mean such things as the valves, timing, ignition, rotating parts revolving without binding, sufficient cooling, etc., it is possible that you might expect from 12 to 16 miles to the gallon, provided that you install a later model carbureter.

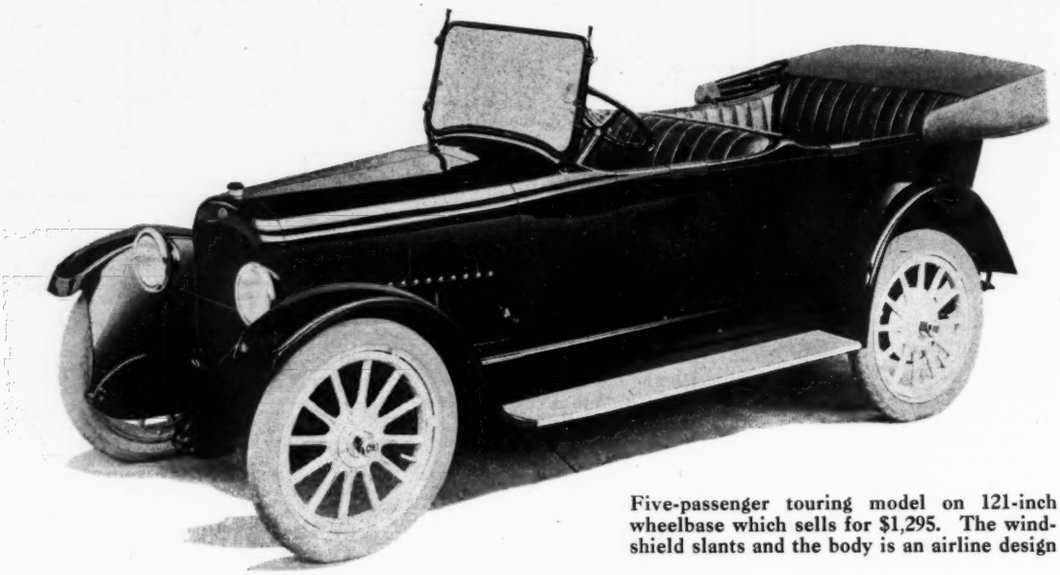
Adjusting Carter Carbureter

Q.—I have a Carter carbureter on my car which seems to be a fool-proof instrument. How can I make an adjustment to give the engine a rich or a lean mixture?—Walter M. Pate, Hoberg, Mo.

You probably have the model F Carter carbureter which is unalterably adjusted at the time of installation. There is, however, an easy starting device on this instrument consisting of a by-pass which connects the float chamber with the manifold above the throttle. Its use enables each cylinder to automatically suck a rich priming charge direct from the float chamber when the engine is turned over. When using it the throttle is kept closed. In the model C carbureter there is a three-way valve, controlled by the easy starting lever, operated by a small rod from in front of the radiator if the car is started by hand, or from the dash if the self-starter is used.

When this lever is thrown forward, a connection is formed between the float chamber and the manifold above the throttle valve, thus providing a passage through which fuel is sucked direct from the float chamber into the cylinders. A simultaneous inrush of air forms, containing an excess of gasoline. As soon as the engine starts the lever must be reversed or the mixture going to the cylinders will be altogether too rich.

Nash Has Overhead-Valve Engine



Five-passenger touring model on 121-inch wheelbase which sells for $1,295. The windshield slants and the body is an airline design

With 1918 Announcement Old Name of Jeffery Gives Way to That of Nash

WITH the announcement of its models for 1918 the Nash Motors Co., Kenosha, Wis., discontinues the name "Jeffery" and henceforth the product of this factory will carry the name "Nash." Nor is it just a change in name. The new Nash six is entirely different from the Jeffery. Ninety-three percent of the Nash is made in the Nash factory and the new six is equipped with what the company chooses to call the "perfected valve-in-the-head engine." This engine differs considerably from usual valve-in-the-head construction, details of which will be told later.

There will be three body styles on the new chassis, a five-passenger touring, a four-passenger roadster on the 121-in. wheelbase and a Springfield sedan on a 127-in. chassis that differs from the shorter chassis only in length. As the seven-passenger member of the line, the Jeffery six will be continued, but will carry the Nash name plate. The Jeffery four is discontinued.

Prices of the five-passenger touring and the four-passenger roadster are $1,295, and of the sedan, $1,985. The finish will be Nash blue, penciled in gold.

While the engine has a standard horsepower rating of only 25.3, block tests have shown it to develop 67 hp. It has a bore of 3¼ in. and a stroke of 5 in. Pistons are light, 3½ in. long and the piston, or wrist pins are ⅛ in. in diameter. Alongside the engine on the right side is a chamber in which the push rods and valve mechanism are inclosed and through which oil vapor rises from the crankcase sufficiently to keep the rocker arms and cams lubricated. The only breather for the oil is through a series of holes along the lower edge of the cover over the head of the engine. Other lubrication is taken care of by a pump, driven from the camshaft by spiral gears, in connection with conventional splash system.

Connecting rods are of steel, drop-forged, double heat-treated, the caps being fastened by two chrome nickel steel bolts. The bearings are 2¼ by 2¼ in. The camshaft is a one-piece forging, the tappets are of the mushroom type and the camshaft is gear driven.

The combustion chambers in the cylinders are machined all over and are exact replicas in size. By making the combustion chamber in the cylinder heads slightly larger than the bore, opportunity is given to make the valves larger. Coiled springs are fitted between the rocker arms.

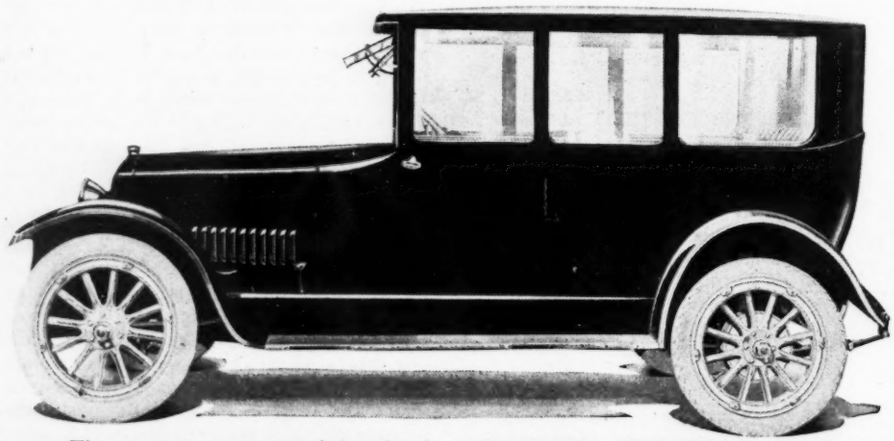
Simplicity marks the construction of the engine. There are no auxiliary shafts used to drive either pump or generator, therefore there are but two gears in the front of the engine. The water pump is driven by the camshaft and the fan is mounted on the extended generator shaft and the whole assemble is driven in a single unit by a belt. There is no necessity for valve cages with the separate cylinder head which gives better cooling facilities.

Exhaust at Front

The outlet of the exhaust manifold is at the front end of the engine, which means that the heat from this pipe does not radiate heat into the driver's compartment.

The engine has a three-bearing crankshaft of extra size and being inherently balanced makes for smooth running and an absence of vibration. The crankshaft is 2¼ in. in diameter and is carried in die-cast bearings, 2¼ by 2¾ in. in front and center and 2¾ by 3¼ in. in rear.

Carburetion is cared for by a modern carbureter with hot air attachment, the fuel being taken through a Stewart vacuum system in which the vacuum tank, instead of being under the hood as usually is the case, is located under the cowl in the driver's compartment. The connections of the tank are all in front of the dash and the tank may be removed by taking out two bolts. There is a special heating device located in the exhaust line. Two pipes, one small and the other large, lead from the heater to the carbureter. Through the



The seven-passenger touring sedan is equipped with a Springfield body and the front chair revolves so that the passenger may face either direction

smaller of these pipes hot air passes to the jacketed carbureter when the throttle is in idling position, but the valve in this line, being actuated by the throttle, closes when the throttle is opened. The larger pipe takes hot or cold air to the carbureter air intake. This is manually controlled from the dash. When the opening in the side of this larger pipe is closed only hot air is taken into the carbureter, but this vent may be opened to admit only cool air.

The intake manifold is fitted directly under and touching the exhaust manifold as will be noted in the illustrations. This also helps in heating the fuel before it passes into the cylinders.

The clutch is a single plate, dry disk, steel to asbestos. The gearset is in a unit with the engine and gives a gear ratio of 14.6 to 1 on low, 8.2 to 1 on intermediate and 4.5 to 1 on high. In reverse, the gear ratio is 19.5 to 1.

Looking at the chassis, the front axle is straight between spring seats instead of being dropped. This makes it possible to swing the car lower, while maintaining the same road clearance. By eliminating the fork on the front axle, the axle is forged at one heat. There is not an unnecessary rod or cross bar on the Nash chassis. The frame has been designed to fit the sill of the body. The side frame, being built to conform to the shape of the body sill, it supports it for its entire length, thus eliminating much of possible body squeaks. The rear cross member of the frame serves both as a cross member and as a support for the gasoline tank and tire carrier.

Hotchkiss Drive

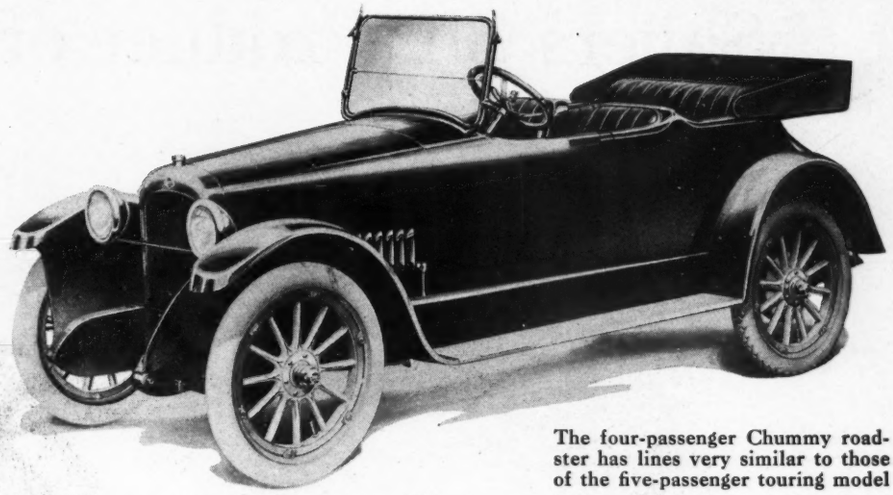
The rear axle is of the semi-floating type with malleable iron center and alloy steel tubular ends. The differential is readily accessible by removing the rear cover. Drive is Hotchkiss, the rear springs, which are semi-elliptic, 56 by 2¼ in., with ten leaves, taking the torque. There are two universals, these being a product of the Nash factory. There is no welding of the driveshaft in making these universals, the tube being upset with a narrowed throat inside and an enlargement on the outside. side.

Starting, lighting and ignition is Delco and as has been indicated previously, the generator is located in front of the engine and is driven with the fan on the same shaft through a Link Belt from a pulley on the crankshaft.

Only the service brakes are located on the rear axle, these being external contracting with 2-in. bands operating on 13. in. drums. The emergency brake also is external contracting, the drum being mounted on the drive shaft. The speedometer drive also is from the driveshaft.

Seats are especially roomy and doors are wide. The rear seat of the touring model is 47 in. wide. Upholstery is deep, of black leather and is buttonless. In both the four and five-passenger jobs the side curtains open with the doors and the fastenings of the curtains are of an improved design. Equipment is conventional, consisting of tools, spare rim, clock, robe straps, etc.

Tires are straight side detachable, 34 by 4, plain in front and all-weather tread in rear.



The four-passenger Chummy roadster has lines very similar to those of the five-passenger touring model

CRUISER COMPANY IS FORMED

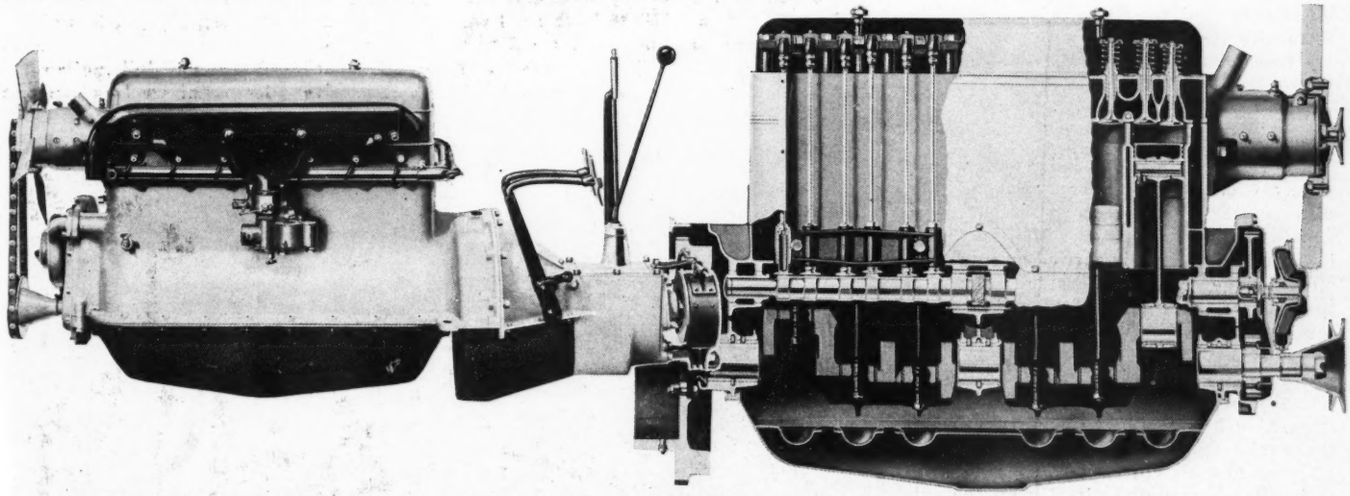
Madison, Wis., Sept. 1—The Cruiser Motor Car Co., a Maine corporation with $250,000 capital, has been organized by Chicago and Madison capital to establish a plant for the manufacture of a new type of convertible touring-camping car. A charter has been granted in Wisconsin, and the local interest is given as $100,000, which will represent the cost of a plant and the equipment. Work will begin immediately and the factory is to be ready in about ninety days.

The Cruiser will be of standard mechanical design, but novel body features such as a self-contained outing and camping equipment. It will be made both as a roadster and touring type. The roadster will list at $1,185.

The officers are: President, W. D. Curtis, Madison, Wis.; vice-president and general manager, Winthrop J. Burdick, formerly treasurer and sales manager New Era Engineering Co., Chicago; secretary, Dwight S. Bobb of Adams, Crews, Bobb & Westcott, Chicago, financial and corporation attorneys.

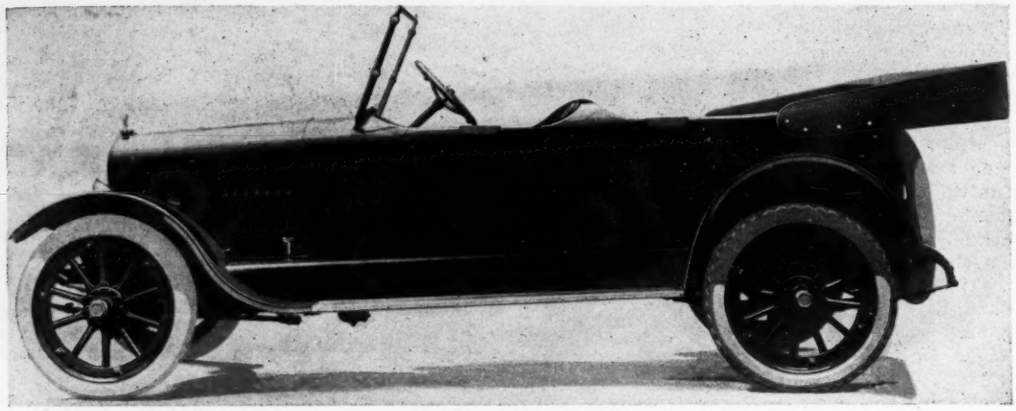
CHEVROLET TO MAKE TRACTORS

Detroit, Sept. 8—The Chevrolet Motor Co. of Flint, Mich., plans to enter into tractor manufacture, according to advices received here from Washington. The secretary of the treasury has allowed certain parts made in Canada by the Chevrolet Canadian factory to be admitted free of duty upon representation that the importations were to be used by the Chevrolet company to make tractors. The ruling was sought and obtained by E. O. Wood of the Chevrolet Motor Co.



On the left is the left side of the new perfected valve-in-the-head Nash engine, showing manifolding, carbureter, generator and fan mounting and the emergency brake arrangement on the driveshaft. On the right is a cut-away view of the engine showing how valves operate and also the chamber through which the oil moisture passes from the crankcase to lubricate the rocker arms and cams

Sayers Six Product of Old Firm



Five-passenger Sayers touring car, made of standard units and priced at $1,295

A LIGHTWEIGHT six has been announced by the Sayers and Scoville Co., Cincinnati, Ohio, which concern has for the last ten years made motor chassis for ambulances and other specialized forms of vehicles. The price of the car is $1,295, and weight equipped for the road, something like 2600 lb.

The factory personnel includes W. A. Sayers, president and general manager; F. F. Scovill, vice-president; Henry Christiansen, chief engineer; Emil E. Hess, sales manager. The car was designed by J. A. Campbell.

The new Sayers Six has a pressed steel frame 5 in. deep and 2½ in. wide, made of $\frac{5}{32}$-in. stock. It is of bottle neck design and suitably braced by cross members. At the front the frame is supported on semi-elliptic springs 38 in. long and 2 in. wide. The rear springs are semi-elliptic and underslung from the axle. They are 54½ in. long and 2 in. wide. All springs are equipped with a self-oiling device to prevent squeaking. The front axle is an I-beam, with the wheels mounted on ball bearings. Wheels are of the artillery type with hickory spokes and fitted with demountable rims for 32 by 4-in. tires. The latter are straight sided, with non-skids in the rear. The brakes are internal expanding and external contracting on the rear wheels.

Bower Roller Bearings

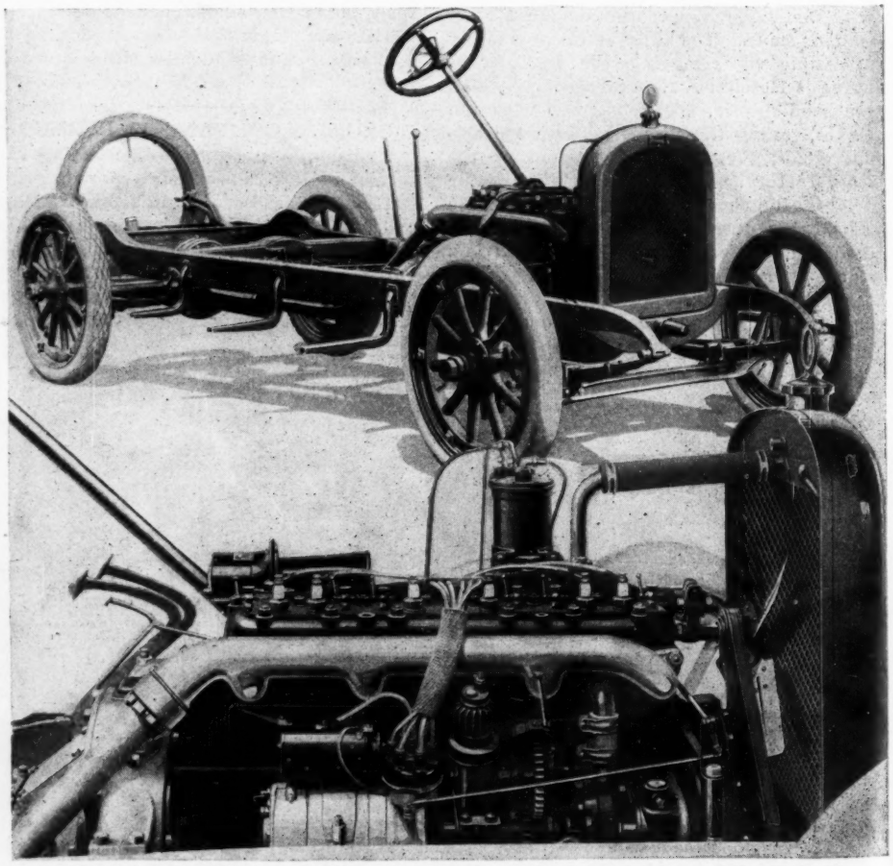
The rear axle is full-floating with wheels mounted on Bower roller bearings. The differential is fitted with spiral cut gears running on ball bearings. The gear ratio is 4¾ to 1. Weight is carried on a pressed steel bridge type of housing. Drive is taken from the axle by the Hotchkiss system, employing two universal joints in the propeller shaft.

The engine is a high speed Continental six-cylinder of L-head construction, with removable head. The bore is 3¼ in. and the stroke 4½ in. The cylinders are cast in block and all valves are inclosed. The carbureter is mounted directly on the cylinder casting. Feed to the carbureter is through a Stewart vacuum tank drawing its supply from the main tank located at the rear of the car under the body. Cooling is by centrifugal pump, employing a Fedders high racing type of radiator. A ball bearing fan is fitted also.

The two-unit Delco starting, lighting and ignition system is standard equipment, with a Bendix drive attachment on the flywheel. The storage battery is a 6-80 Willard and carried under the front seat. In unit with the engine is a Borg and Beck three-plate dry disk clutch and a selective sliding gear transmission with three speeds forward and reverse. In short, standard units are used throughout.

The body is a five-passenger touring type, with long and graceful lines. It is built with a center cowl and roomy. Instruments are mounted on the board within easy reach of the driver. Upholstery is carried out in leather, put on in long French plaits. The chassis is finished in black and the body ultramarine blue.

Equipment includes speedometer, motometer, rain-vision windshield, one-man top



Sayers chassis and close-up of the engine, a Continental six-cylinder

with non-rattling bow holders, extra rim, foot rest for accelerator, combination tail light and license holder, trouble lamp, robe rail, foot rail, tools, tire repair kit, light and ignition locks.

DE LUXE SEDAN FOR FORD

In order to combine Ford reliability with comfort and looks of the higher priced cars, the Detroit Auto Products Co., Detroit, has brought out a deLuxe sedan body to fit the Ford chassis. Deliveries have already begun on this body, which the company states is a timely addition to its line of special bodies in roadster, touring and Victoria types for Fords. The front glass is placed at an angle and the glasses on the sides are amply large so that vision is not obstructed. The rear of the body is molded gracefully and so shaped that there is plenty of room to fit an extra tire carrier. There is a door on each side of the body, fitted with concealed hinges and nickeled door handles.

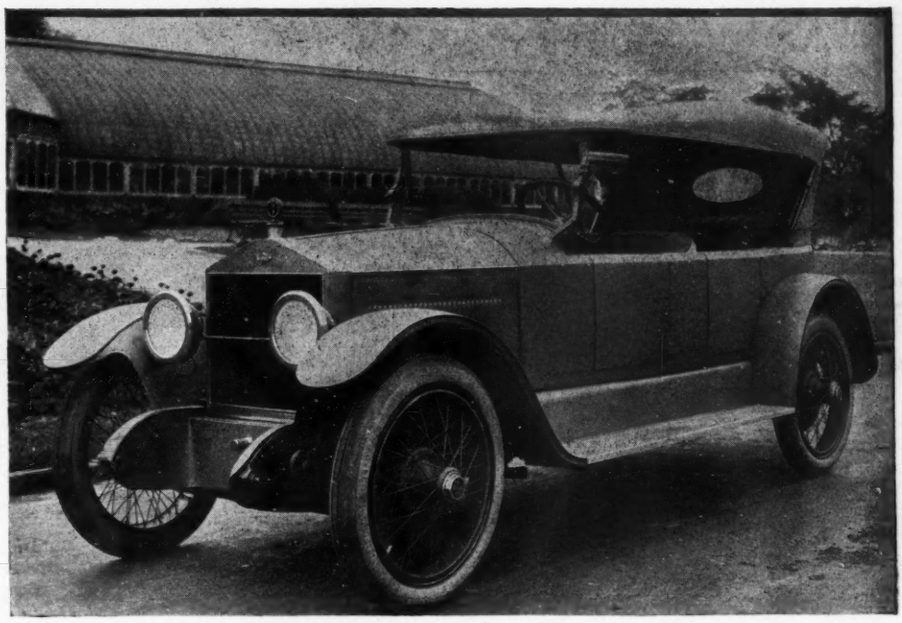
WOLVERINE SPECIAL

The Wolverine Special is a low-hung speedster type of car designed to meet the demands for a sport car. It is built by the Wolverine Motors, Inc., Kalamazoo, Mich., and aside from speed, presents a sound mechanical construction. Owing to the great amount of aluminum used, the car is of minimum weight, but possesses power enough to drive it at a rate of 75 m.p.h. on the road, it is said. The car is called the Speedway Special and the purchaser has the choice of any color or combination of colors he may desire in the finish. The car will sell in the neighborhood of $3,000.

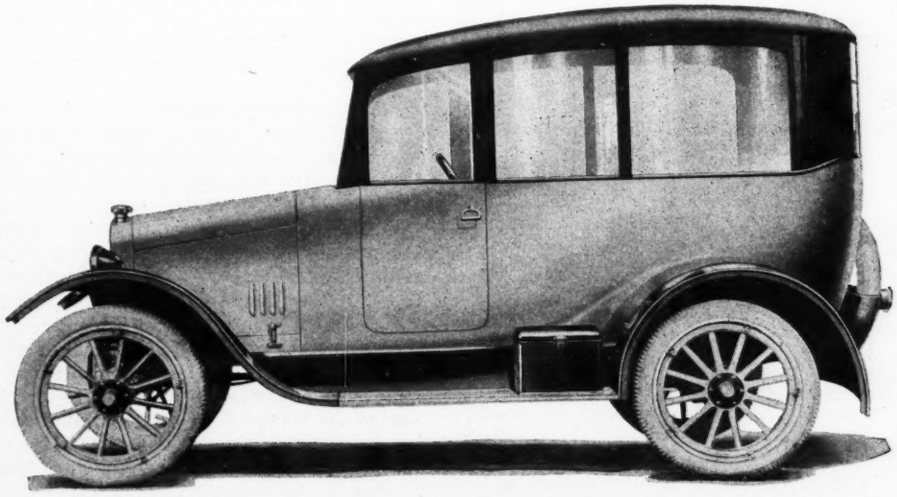
The design calls for a wheelbase of 115 in. and a frame of channel section steel 7 in. deep. The spring suspension is supplemented by Hartford shock absorbers. Wire wheels are to be regularly fitted, equipped with 35 by 5 in. cord tires. A special V-type of racing radiator is fitted, having a copper core with a shell of highly polished German silver. The front and rear axles are the product of the American Ball Bearing Co., Cleveland, Ohio. The standard gear ratio is 2.94 to 1, but this is optional with the purchaser.

The engine is of the four-cylinder type and designed for sustained high speeds. It is under the 300 cu. in. displacement and at maximum speed is said to be capable of delivering 75 hp. Aluminum is used wherever possible and chrome-nickel steel in the parts subjected to wear.

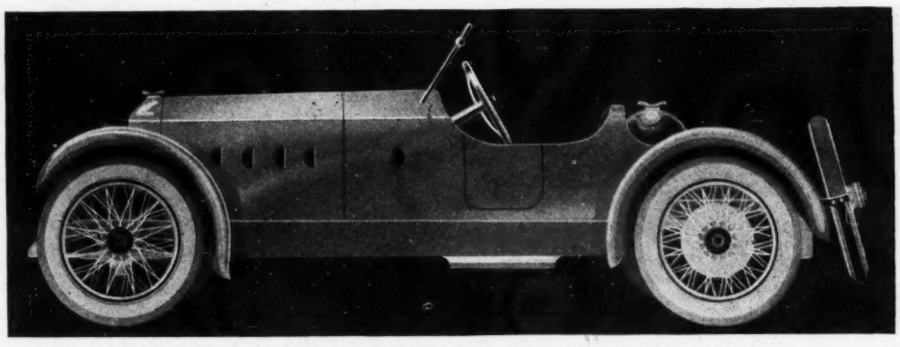
The roadster body is fitted with a sloping windshield and has a 30-gal. fuel tank back of the seat. In addition there are compartments for luggage and tools in the rear. The maximum weight of the car is 2,250 lbs. There is no overhang to the body, it resting flush with the sides of the frame members. The fenders cover the wheels only, there being no running boards. A short step is used for ingress and egress to the body.



Four-passenger touring car, one of the two new Murray models



Comfort and looks are combined in this deluxe sedan for Ford cars



The Wolverine Special is designed to meet demands for a sport car

TWO NEW MURRAYS

Pittsburgh, Pa., Sept. 7—The Murray Motor Car Co. has brought out two new models, a four-passenger touring car and a roadster. The lines of these are quite different from the touring car and combine the Rolls-Royce radiator with the straight-line, low-body effect. The short bevel corner is carried out all the way around the body on the four-passenger touring car as well as on the roadster, the lower corner of which runs into the hood hinge. This effect also is carried out on other parts of the car, in the windshield for instance. One of the features of the Murray is the set of new universal-type Hartford shock absorbers as stock equipment.

The seven-passenger touring cars remain the same as before with a few minor refinements. The chassis is practically the same. The wheelbase is 128 in. The seven-passenger, four-passenger and roadster sell for $2,800 each. The bodies are entirely of aluminum, with hand-buffed leather. The roadster has two auxiliary seats on the rear deck.

The Accessory Corner

Special Ford Storage Battery

A SPECIAL storage battery for Ford cars placed on the market by the Michigan Storage Battery Co., Detroit, is made low enough to be placed under the seat instead of in the customary steel box on the running board. The batteries are built in 70-, 90- and 110-amp. capacity, which, it is estimated, will meet the requirements of all Ford owners.

The Borman Process

The Borman process, on which a patent is pending, is for repairing scored cylinders and is guaranteed to last the full life of the engine. It is applied electrically and chemically without reboring or regrinding cylinders. Prices for an engine of four cylinders by the Borman process range from $6.50 to $10, to dealers only—E. Borman Corp., 1612 Michigan avenue, Chicago; 453 Michigan avenue, Detroit.

Lancaster Diffusing Lens

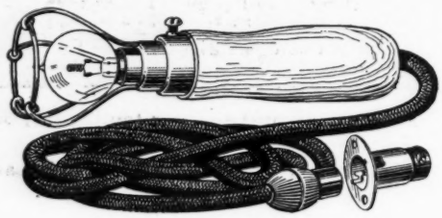
The Lancaster diffusing lens is a permanent non-glaring appliance which has been approved by the Department of Motor Vehicles of New Jersey. As its name implies it lays claim to its non-glare capacity through the character of lens rather than a disk or other device. It can be used for gas or electric headlamps and varies, according to size and diameter, from $1 to $2.50 a pair. Lancaster Lens Co., Lancaster, Ohio, maker; Star Lens Co., Chicago, distributor.

Zenith Compensating Charts

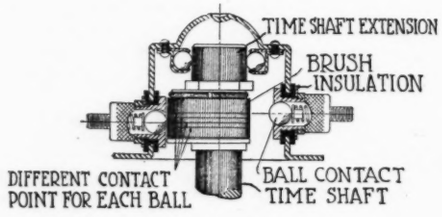
A set of four charts, printed in colors, of the compensating principle around which the Zenith carbureter is constructed has just been issued by the Zenith Carburetor Co., Detroit. The charts explain the Baverey principle whereby the single jet is combined with the constant flow device to form the compound nozzle of the Zenith, giving a constant proportion of air and gas under changing speed, load and atmospheric conditions. The charts will be sent on request to engineers and motor car and technical schools.

Ceco Valve Rotator

The purpose of the Ceco valve rotator is to make it impossible for carbon deposits to form and to eliminate pitting. It is applied to poppet valve types of engines to convert the motion of the valves from a straight reciprocating action to a combination of rotating reciprocating motion. The action of the rotator causes a positive partial revolution of the valve on the upstroke and on the return stroke the valve is reseated in a different position from that it occupied at its previous closing. It is claimed also that warping and distortion are impossible with the rotator because unequal heating is avoided by bringing a different portion of the valve head and steam into the path of the flame on each up and down movement. This equalizes the expansion of the metal, it is said, with the result that the valves will not stick. The rotator is composed of three parts, two mounted on the valve stem which must be turned down to form a slightly defined shoulder, and another locked to the valve stem. The rotator is made in a complete range of sizes to meet the requirements of the valve assemblies of standard engines. The application can be accomplished without change in the design of the engine simply by substituting the bronze bushing for the part where the valve guide is extended.



Vesta trouble lamp, for U. S. Army trucks specially



Cross-section of Bemus ball contact timer for Ford cars

Presto cloth cleans the rain mist and prevents formation

The maker of this rotator is the Continental Engineering Corp., Omaha, Neb.

Peerless Anti-Freeze

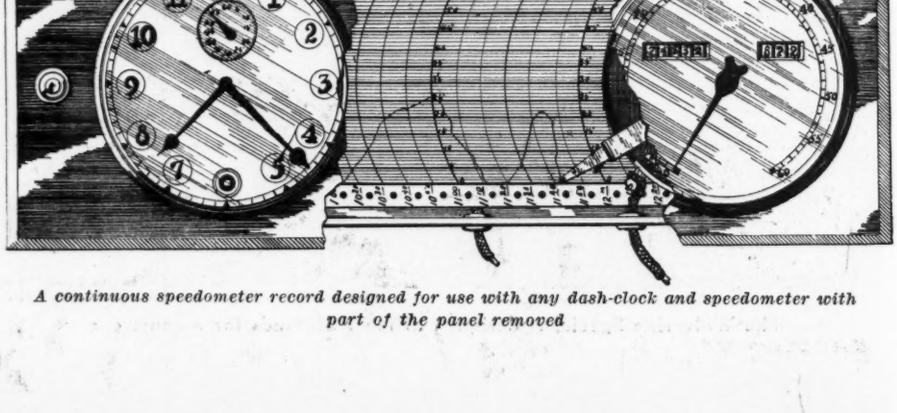
Peerless anti-freeze for cooling systems of motor cars, sold in 1-gal. cans and barrels, is accompanied by a chart giving the approximate amount needed for some of the leading cars. It is said not to lose its strength like alcohol, and unless there is a leak or the radiator boils over, one filling is sufficient for the winter's driving. The proportion of half Peerless anti-freeze and half water is said to be sufficient to keep a car from freezing at about 15 deg. below zero. For a colder temperature, more anti-freeze is used in proportion to the water, all of which is explained on the chart. Prices to dealers and garages are: 6 to 10 bbl., 70 cents a gallon; 1 to 5 bbl., 75 cents; and 6-gal. cases, 90 cents. Columbus Varnish Co., Columbus, Ohio.

Snap-On Theft Preventor

The anti-theft device manufactured by the Cairwald Mfg. Co., Philadelphia, Pa., can be attached in 3 sec. but cannot be removed except with the key to its Yale lock. If the lock is tampered with a gong rings until the tampering ceases. The gong does not ring when the proper key is inserted, however. The device is attached to a front wheel and makes it impossible to tow, push or drag the car with it on. Prices, tires 3 to 3½ in., $10; tires 4 to 4½ in., $15; tires 5 in., $20; tires 5½ in., $25.

Hy-Grade Cylinder Grinder

The Hy-Grade cylinder grinder has an upright frame and lower surface table cast integral, with the vertical ways and bottom surface carefully machined and scraped perfectly square to insure accurate alignment. The cylinder to be ground is mounted on a plate which may be adjusted to bring the different bores into the grinding position, this plate being carried on ways that extend the full length of the machine. The spindle is carried in a movable head and may be adjusted to travel around the bore of the cylinder while rotating on its axis. Up and down feed is controlled by a rod with adjustable stops that



A continuous speedometer record designed for use with any dash-clock and speedometer with part of the panel removed

govern the clutch between the two bevel gears. All operating levers are at the front of the machine. Counterweights relieve all strain and tendency toward excessive wear. The spindle head is equipped with adjustable bronze bearings, and the spindle is carried by double-row ball bearings and adjustable bronze bearings furnished with non-leaking oil retainers. The dimensions of the machine are 6 ft., height; total travel of spindle head, 22 in.; length of grinding spindle, 16 in.; movable plate that supports work, 16 by 22 by 2½ in.; working space under machine, 18 by 22 in.; floor space occupied, 28 by 32 in. Hy-Grade Machine Co., Cleveland, Ohio.

Dash and Post Adjusters

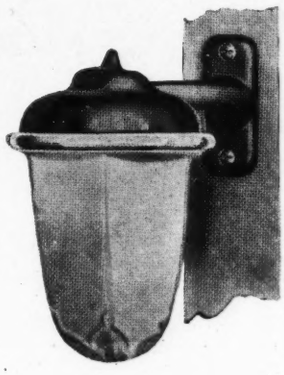
The Breeze dash and post adjusters are made for carbureter chokes, needle valve adjustments and so on. The plate attaches either to the dash with screws or is held by a retaining nut or encircles the steering post with a band. The value lies in the ability of the driver to make and change adjustments without leaving his seat. A coiled wire is used as a case, the adjusting wire being run through the inside. The adjusted piece is worked by pulling and pushing the button to which the inside or control wire is fastened. The tube type offers the most resistance. The inner wire is bent into a broad U inside the tube, and this working against the wall holds the position. The devices are easy to install, it is said, and very simple in construction. Quotations are given on special assemblies and quantities. Breeze Mfg. Co., Newark, N. J.

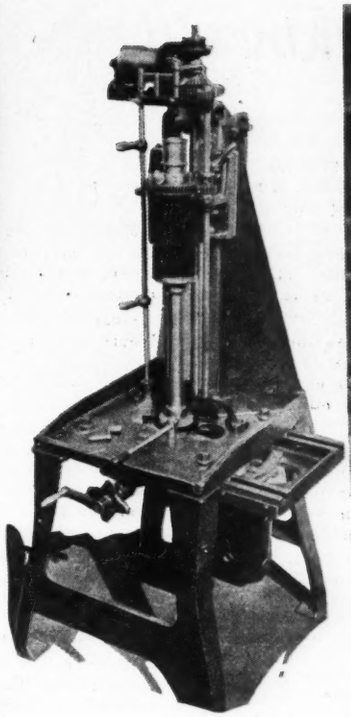
Tire Inflator Outfit

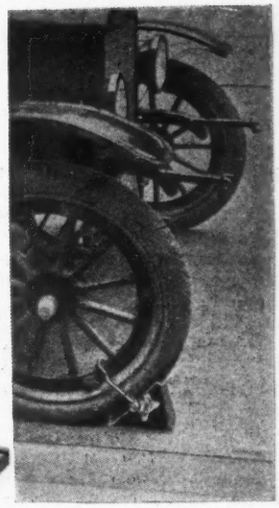
The tire inflator outfit made by the Black & Decker Mfg. Co., Baltimore, Md., is automatic and works immediately on turning the switch, continuing until the pressure in the tank reaches 150 lb., when the automatic pressure switch comes into action and stops the machine. To inflate a tire, the Romort air chuck on the end of the hose is pressed over the tire valve and the pressure in the tire will rise instantly, it is claimed, to the pressure desired. The device has no exposed mechanism, electrical or mechanical. A cover furnished for the automatic switch completely incloses all mechanical and electrical parts. The machines can be used on 110-volt, direct or alternating, current of from 25 to 60 cycles. The Northern Electric Co., Ltd., is exclusive Canadian distributor for the Black & Decker line.

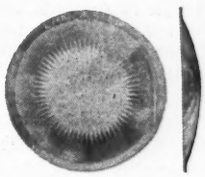
Bemus Ball Contact Timer

The Bemus ball contact timer for Ford cars consists of a die-molded piece of brush holder on which is mounted a section of hardened steel tubing ½ in. wide accurately fitted. The contact surface measures 3½ in., as compared with 1¼ in. on former brushes. If necessary, balls and brush surface can be replaced and costs but a few cents. The timer is mounted on a shaft to which the brush assembly is attached by an extension piece screw threaded on to the shaft, which runs in ball bearings in the recess of the timer shell. Easier starting is claimed through the use of balls for contacts. This is due to the inability of the balls to retain more than the slightest film of oil on their surfaces, which is cut through the instant contact is made, whereas the oil becomes hardened on the flat contact segments of many timers, and prevents the passage of current until constant turning has scraped or worn off the grease. The device is made by the Motor Specialties Co., Waltham, Mass.

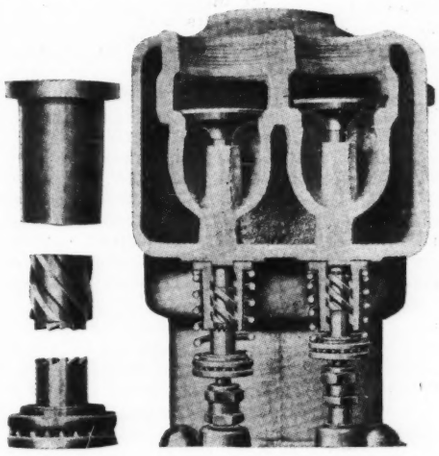








Above — Vesta pillar lamp for closed cars. The Higrade cylinder grinder is shown in the center, and at the right of it is the Cairwald anti-theft device attached. Just below appears the Lancaster diffusing lens, front and side views



Ceco valve rotator for application to poppet valve types of engines

Cloth Windshield Cleaner

Presto cloth is prepared chemically for cleaning wet windshields. The chemical removes the mist formed by the rain and deposits a coating that prevents further mist formation. Presto Cloth Mfg. Co., Toledo, Ohio.

Continuous Speedometer Record

The continuous speedometer record consists of a strip of paper divided vertically into days, hours and minutes, horizontally into miles per hour and moved by clockwork beneath a pencil attached to a secondary speedometer needle. The mark left by the pencil shows the speed at which the car was traveling at any time. Any type of dash clock or speedometer can be adapted to the device. A speedometer fitted with special recording needle is mounted at one end of an instrument panel and a clock, geared to a star-wheel drive at the other end. The star wheel draws the record chart from a roll behind the speedometer under the needle and winds it up on a roller behind the clock. The face of the chart is treated chemically so that a brass pencil may be used to transmit the record. All the working parts are locked in the panel, though a small window permits part of the record to be seen. The device has been patented by C. J. Welch, 200 East Grand boulevard, Detroit.

Two Lighting Specialties

The Vesta Accumulator Co. has put on the market two new lighting specialties, reproduced on these pages. They are a pillar lamp, listed as No. 415, and a trouble lamp, No. 74. The pillar lamp is for a limousine, coupe or other closed type of car and sells at $10 a pair. The trouble lamp, made specially to conform with U. S. Army truck specifications, includes a 10-ft. cord, bulb and socket and sells for $3.50. The Vesta company also has begun the publication of a house organ called "The Vesta Twelve-Eighty," which will be distributed to its service stations, for the betterment of which it is issued.—Vesta Accumulator Co., 2100 Indiana avenue, Chicago.

Hammer-Handled Screwdriver

The Crescent screwdriver has a handle of metal pivoted at the central point, thus permitting the handle to be swung at right angles to provide increased leverage or to allow it to be used as a hammer in starting a screw. The blade is drop-forged, hardened and tempered. The entire tool is nickeled. Price, 7½-in. type, $7.80 a dozen. Crescent Tool Co., Jamestown, N. Y.

Among the Makers and Dealers

CONTINENTAL to Build $200,000 Plant—The Continental Motors Corp., Muskegon, Mich., has purchased a new site and will build a $200,000 plant on it.

To Double Capacity of Plugs—The Gas Motor Efficiency Co., Janesville, Wis., maker of spark plugs, will double its capacity to provide for a production of 1200 plugs a day.

Harger Enlists in Marine Corps—R. M. Harger, advertising manager of the Saxon Motor Car Corp., Detroit, has enlisted in the marine corps and will report for service immediately.

Thomas Now with Hercules—Urving Thomas, formerly factory manager of the Lozier Motor Co., is now production manager and efficiency superintendent of the Hercules Motor Mfg. Co., Canton, Ohio.

Carlton Is Prudden Wheel G. S. M.—C. C. Carlton has been appointed general sales manager of the Prudden Wheel Co. Mr. Carlton formerly was manager of the rim department of the Firestone Tire & Rubber Co.

Patent Office for Wire Wheel Corp.—The Wire Wheel Corp. of America has established a patent department at its general offices, Buffalo, N. Y. B. M. Kent, of Washington, has been retained as patent counsel for the company and will have charge of the work of the department.

Des Moines Dealers Help Recruit—The Motor Trades group of the Des Moines Chamber of Commerce played an important part in the recruiting of the Iowa ammunition train, the latest military unit to be raised in Des Moines. The unit of nearly 500 men was filled in less than a week. Full page advertisements were taken in the daily newspapers by dealers and a military band in motor trucks paraded the streets.

Los Angeles to Auction Used Cars—The Edgar O. Wardell Co., auctioneers, of Detroit, have established a clearing house for the sale of used cars at auction in Los Angeles. This is the third time this scheme has been tried there, the two previous attempts having proved failures. One attempt, under the auspices of the Motor Car Dealers' Association, was abandoned after the second week. Wardell claims this city is about the only motor car center in the country without a motor car auction clearing house. He plans later to establish a similar place in San Francisco.

Edison Gives Ten-Year Guarantee—The Edison Storage Battery Co. has devised a ten-year guaranty for the Edison alkaline storage battery.

Moore with Wallace Hood Bureau—H. S. Moore has been appointed sales manager of the Wallace C. Hood Service Bureau. Mr. Moore was formerly with the Standard Detroit Tractor Co.

Heartz Is Made Moreland Manager—H. D. Heartz has been made manager of the Moreland Motor Truck Co., Los Angeles, Cal. Mr. Heartz was formerly sales and service manager for the Hupp Motor Car Co.

Reis with Star Tire Co.—L. I. Reis has become secretary and sales manager of the Star Tire Co., with headquarters at the New York office. He has for the last three years been eastern district manager of the Knight Tire & Rubber Co., Canton, Ohio.

Holt Trebles Size of Plant—Holt Mfg. Co., Peoria, Ill., has added to its holdings of land and contemplates trebling the size of its factory to handle Government contracts aggregating $10,000,000. New machine shops, foundry, etc., will be required.

Challoner Plans New Truck Chain—The Challoner Co., Oshkosh, Wis., for many years a manufacturer of sawmill and woodworking equipment and other machinery, is preparing to devote most of its attention to the production of a new type of non-skid chain for motor trucks to be marketed under the name of Giant Grip. The company has disposed of its foundry equipment and will use this shop for the manufacture of the non-skid device. The die-room will be doubled in size and new equipment installed.

Auto Body Doubles Business—The Auto Body Co., Lansing, Mich., has doubled its business in the last twelve months and has orders on its books unfilled amounting to $1,750,000. To secure additional working capital to take over this large increase in business, the company will sell $250,000 worth of unissued treasury stock. Stockholders will be permitted to buy stock at par, although the stock is quoted at double par. Par is $10 a share. The company's sales for the first eight months of 1916 were $864,189. Sales for the same period of 1917 totaled $1,350,996. The plant is reconstructed with double capacity.

O'Brien with Nordyke & Marmon—J. H. O'Brien, formerly general manager of the Ross Automobile Co., is now with the Nordyke & Marmon Co.

Brush to Represent Elgin in Canada—George L. Brush, Canadian manager for the Harroun Motors Corp., has been appointed Canadian manager for the Elgin Motor Car Corp. of Chicago.

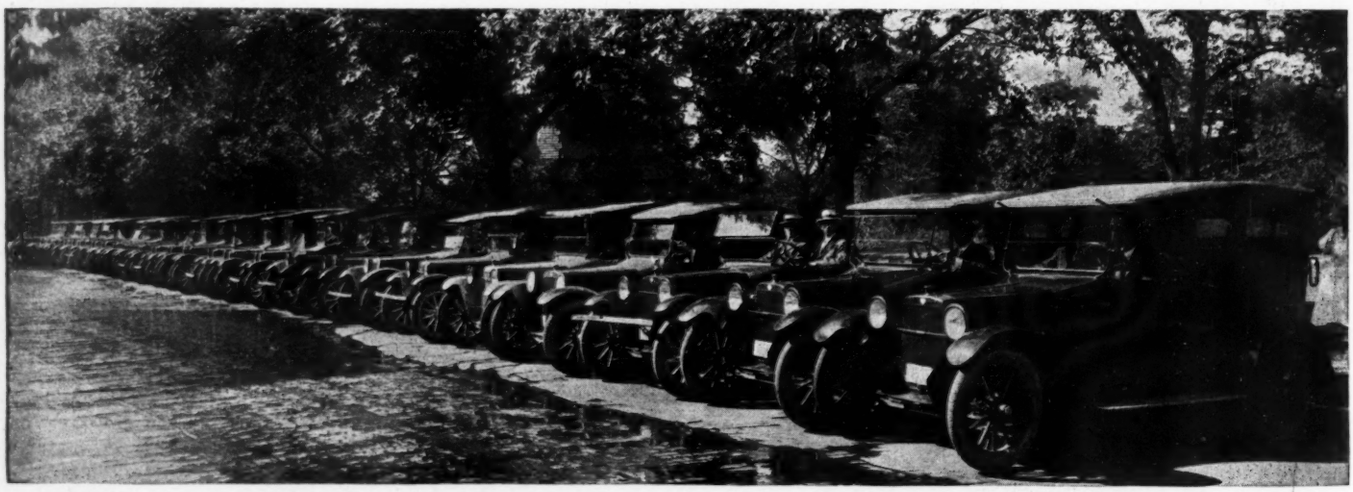
Smith Leaves Maxwell for Wright-Martin—F. H. Smith, assistant purchasing agent of the Maxwell Motor Co., Detroit, has resigned to join the Wright-Martin Aeroplane Co. at New Brunswick, N. J.

New 2-Ton Truck Is Planned—H. P. Marmen, for several years salesmanager of the Westcott Motor Car Co., Springfield, Ohio, has opened an office at St. Louis, Mo., for the organization of the Traffic Motor Truck Corp., which is planned to begin operations with $500,000 capital. The company will specialize in a 2-ton truck.

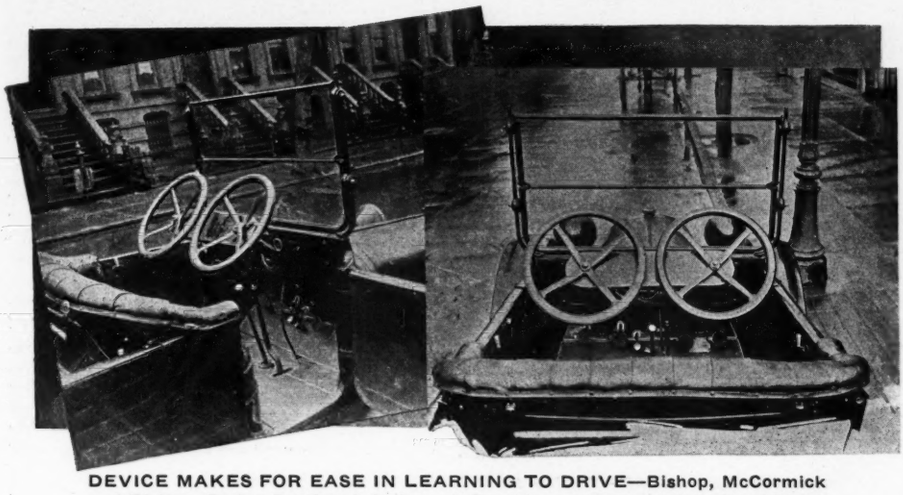
Largest Olds Distributor Moves Near Plant—The Consolidated Oldsmobile Co., the largest Olds distributor in the United States, is moving its headquarters from Cleveland, Ohio, to Lansing, Mich., to get better service by proximity to the Olds factory. The company controls 200 dealers, five sales divisions and handles more than 4000 Olds cars a year.

Lawton Becomes Bela Body Treasurer—Ott A. Lawton has been elected treasurer and director of the Bela Body Co., Amesbury, Mass. He also is a director of the H. H. Franklin Mfg. Co., Syracuse, N. Y. The Bela company, it is stated, has accepted an additional contract to build 1000 sedan bodies for the Franklin company. This order will require the erection of a new building of about 20,000 sq. ft. of floor space.

Mason Tire Erecting New Building—The Mason Tire & Rubber Co., Kent, Ohio, is building a new warehouse which will be finished within the next two months. A new cement house is in course of construction and the new boiler room will be completed in a month. The vulcanizing room will be enlarged by the addition of a two-story building, 40 by 84 ft. A new mill room, 109 by 60 ft., is also in course of erection. The restau-



DEALER MOBILIZES HIS CUSTOMERS FOR SERVICE—The Northwestern Automobile Co., Saxon dealer at Minneapolis, Minn., reported the first squad to be sworn in for the Minnesota motor reserve of car owners. The squad consists of twenty-seven, two corporals and a sergeant. Hennepin county has 2500 motor reservists. Fifteen hundred enlisted one day



DEVICE MAKES FOR EASE IN LEARNING TO DRIVE—Bishop, McCormick and Bishop, Dodge Brothers' dealers at Brooklyn, are responsible for this car with double steering wheel. The device permits the instructor to retain control of the car while the pupil steers and shifts gears

rant for the employees will be in full operation by Sept. 1. Plans are now being drawn for a new office building to be ready by Jan. 1.

Army Takes Hall from Premier—Richard Hall, purchasing agent for the Premier Motor Corp., has been called as an officer for the army.

Adamson Adds to Foundry—The Adamson Mfg. Co., East Palestine, Ohio, has erected a large addition to its foundry building and is manufacturing Ford brake shoes, lined and unlined, light gray iron castings for motor car parts and other specialties to be announced later.

Eaton Heads Kalamazoo Spring & Axle—C. H. Eaton has been elected president of the Kalamazoo Spring & Axle Co., Kalamazoo, Mich., F. V. Wicks is treasurer and J. S. Clary, secretary. Mr. Clary was formerly with the Lee & Porter Axle Works, Buchanan, Mich.

Madison Dealers Exhibit at Fair—Fourteen dealers of Madison, Wis., representing thirty makes of cars, exhibited at the Dane County fair at Madison. Three large circus tents were used for the show, which was conducted under the auspices of the Madison Automobile Dealers' Association.

Goodyear Promotes Jones to Home Office—Lake P. Jones of the St. Louis Goodyear branch has been promoted to manager of the school for salesmen of the Goodyear company at Akron, Ohio. He was guest of honor at a banquet arranged by his fellow workers in St. Louis on the evening of his departure.

Declares 100 Per Cent Dividend—The Toledo Machine & Tool Co., Toledo, Ohio, has declared a stock dividend of 100 per cent to stockholders of record Aug. 27, of the $3,000,000 authorized capital. There will be outstanding $2,400,000 after this dividend is paid. The company paid a 100 per cent stock dividend in 1915.

F-W-D Adds Fourth Building This Season—A new assembly room and storage building, 100 by 180 ft., will be erected immediately by the Four-Wheel-Drive Auto Co., Clintonville, Wis., making four large structures to be added this summer. The other three buildings are: Machine shop, 100 by 180 ft.; heat-treating room, 40 by 60 ft., and paint shop and warehouse, 100 by 120 ft.

Shaw Heads Ohio Electric—George W. Shaw has been elected president of the Ohio Electric Car Co., succeeding N. V. Barbour. H. C. Kreps, formerly purchasing agent, has been elected assistant secretary and treasurer. E. L. Hoffman has been appointed assistant to the president and assistant general manager; A. B. Moore, formerly branch manager at Kansas City, was made sales manager to succeed J. A. Kellam, who is going into the retail motor car business in Toledo.

Lane a Monroe Special Representative—F. K. Lane, formerly sales manager of the Chevrolet Motor Co., is now special representative for the Monroe Motor Car Co.

Halladay Moves Plant to Warren—The Halladay Motor Car Co., Mansfield, Ohio, will move its plant to Warren, Ohio. The Warren Board of Trade has given the company 25 acres as a site. The company expects to be in operation in a new building by Dec. 1.

Topp-Stewart Breaks Ground—Ground has been broken for the first unit of the new plant of the Topp-Stewart Tractor Co., Clintonville, Wis., originally organized as the Four Wheel Tractor Co. and recently enlarged by a capitalization of $500,000. The main shop will be 66 by 176 ft. in size, of brick and steel, with sawtooth roof, and separate power plant and office building. The company owns 100 acres of land for future extensions.

Nash Motors Promotes Wilson—J. T. Wilson has been promoted to the position of assistant manager of the Nash Motors Co., Kenosha, Wis.

Davy Resigns from U. S. Truck—Charles E. Davy has resigned as general superintendent of United States Truck Co. Mr. Davy will be located in Detroit after September and will announce his new connections soon.

Rowley Becomes Federal Truck Official—W. C. Rowley has been elected vice-president in charge of sales for the Federal Motor Truck Co., succeeding J. F. Bowman. Mr. Rowley for some time has been a member of the board of directors.

Hupp Promotes Salisbury—C. E. Salisbury has been made service manager by the Hupp Motor Car Corp., succeeding J. L. Kenyon, who has resigned to join the forces of the General Motors Corp. Mr. Salisbury was assistant service manager.

Langenbacher Joins Duplex Truck—Andrew Langenbacher has been appointed sales manager of the Duplex Truck Co. Mr. Langenbacker formerly was with the Reo Motor Car Co. in charge of exports.

Field Licenses Manufacturer of Its Engine—The Field Motor Co., Grand Rapids, Mich., has signed an agreement with the Chandler & Taylor Co., giving the privilege to manufacture engines under the Field patents on a royalty basis.

American Magneto Reorganizes—The American Magneto Co., Monroe, Mich., is reorganizing with a capital of $400,000 and will move its plant to Toledo, Ohio. The company manufactures magnetos for motor cars, gas engines and airplanes. It is moving to Toledo because of inability to get skilled labor in Monroe.

Schwab Heads Adams-Williams—Francis C. Schwab has been elected president of the Adams-Williams Mfg. Corp., New York. C. D. Williams was re-elected vice-president, and L. W. Schwab was elected secretary and treasurer. The company is making a line of convertible tops, or glass inclosures, for several makes of passenger cars.

Bigga Trailer Buys Plant—The Bigga Trailer Corp. has purchased a plant at Corunna, Mich., with 80,000 sq. ft. of floor space, mill building, steam plants and electric light plants and will produce 200 heavy duty trailers per week, including bodies. The main office of the company will also be located at Corunna.

Saginaw Motor to Increase Capital—The Saginaw Motor Car Co. will increase its capital stock to secure working capital for large quantities of material necessary to the increasing business which the company is having. Plans are for the production of 1000 cars in 1918. The company's present capital is $100,000.

Continental to Establish Parts Stations—The Continental Motors Corp. is considering plans for the sale of parts of its products in Philadelphia, Chicago, Kansas City, Boston, and Indianapolis by opening parts stations in these cities. This plan would relieve motor car distributors and dealers from the expense of carrying large stocks of parts for Continental engines.

Fageol Motors Completes First Unit—The Fageol Motors Co., Oakland, Cal., has completed the first unit of its factory. When finished the plant of four buildings will have separate units for the manufacture of trucks, tractors and passenger cars. The officers are: President, L. H. Bill, formerly general manager of the Thomas B. Jeffery Co.; vice-president, Webb Jay, Chicago; secretary and general manager, Frank R. Fageol, and general sales manager, J. L. Olsen.

Coming Motor Events

CONTESTS

*Sept.	15—Providence, R. I., speedway race, championship.
Oct. 6 or 13	—Chicago speedway race.
Sept.	28—Trenton, N. J., track race.
*Sept.	29—New York speedway race, championship.
Oct.	6—Danbury, Conn., track race.
Oct.	6—Uniontown, Pa., speedway race.
Oct.	15—Richmond, Va., track race.
*Oct.	13—Chicago speedway race, championship.
Oct.	27—New York speedway race.
*A. A. A. championship award event.	

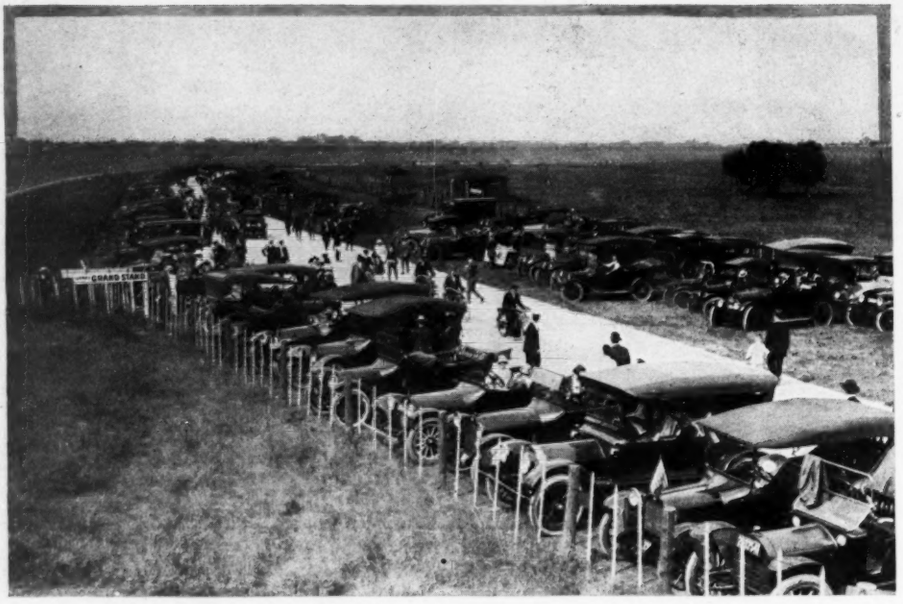
MEETINGS

Sept. 12-14	—Atlantic City, N. J., Motor and Accessory Manufacturers, mid-season meeting.
Oct. 9-11	—Pittsburgh, Pa., National Association of Purchasing Agents, annual congress.

SHOWS

Sept. 9-15	—Milwaukee show, State Park fair, West Allis, Wis.
Sept. 17-24	—Grand Rapids, Mich.
Sept. 22-29	—Chicago, Ford accessories.
Oct. 1-6	—Buffalo, N. Y., closed cars.
Oct. 6-13	—Cincinnati, Ohio.
Oct. 9-12	—Toledo, Ohio.
Oct. 13-28	—Dallas, Tex., state fair.
Nov. 12-18	—Denver.
Jan. 5-12	—New York.
Jan. 19-26	—Montreal, Canada.
Jan. 26-Feb. 2	—Chicago.
March 2-9	—Boston.

From the Four Winds



WITH MOTOR RACE ENTHUSIASTS—Part of the parking crowd of motor race enthusiasts who saw the Labor Day races at Chicago. This is another bit of proof that racing will never die as long as a speedway can furnish the attraction of stellar drivers such as de Palma, Chevrolet and others

HAWAIIANS Drop Ukelele for Tire—Thirty men competed at Honolulu, Hawaii, recently for honors in a tire-changing meet. The contest was held at a theater and covered deflation, removal of casing from rim and tube from casing, replacing the tube and casing and inflation of 50-lb. pressure. The Goodyear team of two men won in 1 min. 47 sec.

Spokane, Wash., Welcomes Tourists—About the time the motorist enters the city limits in Spokane, Wash., he meets a motorcycle officer, and visions of innocently broken laws, a lost license tag or tail-light gone dim fill his mind. But he only gets a booklet describing motor trips in the vicinity and a copy of the traffic ordinance, called "Forty Journeys into the Green Summer Playground," with maps, pictures of scenic spots, mileage and routes.

Kansas City, August Toll, Sixty Cars—Sixty cars were stolen in Kansas City in August. Of these twenty-nine were recovered. Most of them evidently had been used for joyriding. They were found deserted. Twelve arrests were made during the month, and three men are now in the county jail awaiting trial in the criminal court, their cases being sufficiently clear to warrant their being held. The increasing number of thefts is stimulating interest in plans to check cars more carefully, and the local association of garagemen is planning to promote an ordinance under which various registration features will be obligatory and it will be harder for a thief to get away.

No Signs on These Highways—The Missouri highway department has issued instructions to road overseers and county highway engineers to remove immediately all advertising signs from trees growing along the public highways. This is one of the requirements of the new road law.

Motor Cars Work on Railroad—In addition to their efficiency in passenger service, the Mount Hood Railroad Co. of Hood River, Ore., has found gasoline rail motor cars more effective and cheaper of operation when used in construction work than steam-driven trains. The valley line recently was confronted with a bad place in its right of way. One of the company's two rail motor cars and four push cars were put into commission, and in ten days a big fill was completed.

United in Texas: Touring and Railroad—The Atchison, Topeka & Santa Fe Railroad will place in operation several specially equipped flange wheel motor buses on its Pecos valley division. These buses are to take the place of regular passenger trains. Each bus will accommodate twenty-two passengers. It is claimed they can be operated more cheaply than ordinary passenger trains. Their schedule will be 30 to 40 m. p. h. If this new character of service proves as satisfactory as is expected, it is probable that it will be adopted by several other railroads of Texas where passenger travel is light.

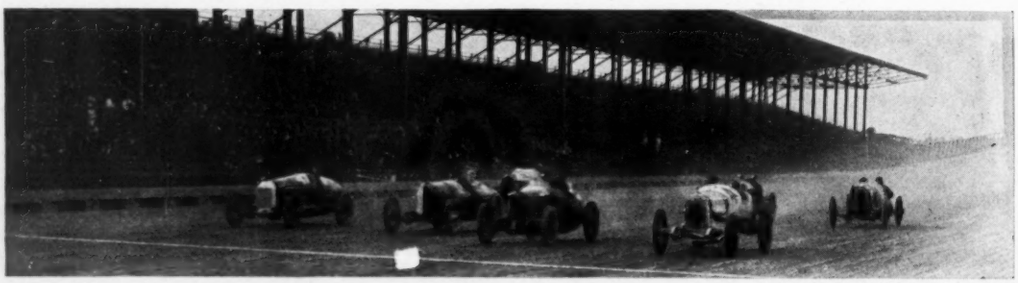
Thirteen Years Old But Still Working—J. L. Hansen of the Siam Electricity Co., Bangkok, Siam, on a visit to this country, stated that his company has a fleet of five electric vehicles, two of which have been in service since 1904. The thirteen-year-old veterans are used for lamp delivery, while the others are used by wiremen and in other ways.

Boy Scouts Help Improve Traffic—To improve traffic conditions in the downtown district, Louisville, Ky., Boy Scouts did traffic duty at the principal corners two days recently. Cane sticks were used to keep back the crowds when the semaphore of the traffic policeman closed the crossing to pedestrians. When the semaphore indicated that the crossing was open the boys raised their sticks and permitted the crowds to pass on. Circulars were distributed among pedestrians and the sidewalks marked with chalk.

Fire Motors Save for Cincinnati—Motor fire apparatus recently ordered for the Cincinnati, Ohio, fire department will supersede ten fire stations now in service with horse-drawn vehicles. It is estimated that it costs $1 a day to keep each horse in the fire department. Horse-drawn apparatus requires a driver, an engineer and a stoker for fire engines and another driver for the horse wagons. The motor takes the place of both wagons and also does away with the need for an engineer, a stoker and one driver.

9000 Miles Without Engine Trouble—Samuel Bullman of Dallas, Tex., arrived in St. Louis, Mo., recently at the end of a 9000-mile trip without having lifted the hood of his car except for oiling purposes. The tour was through Texas, New Mexico, Wyoming, Montana, Yellowstone Park, North and South Dakota, Minnesota, Iowa, Illinois and Missouri. His car climbed the Rattoon Pass, which rises 12,000 ft. at a distance of 12 miles, without trouble. In one day it forded eighteen creeks and small rivers.

How a Canadian Transformed His Car—A. Mathers of Saskatoon, Can., thought by using his car he could lighten the labor on the farm, so he removed the rear wheels and substituted a pair from an old binder. The total cost for the transformation was $40, but it enabled Mr. Mathers to do the whole farm work without horses and with little labor. During the year the machine plowed 50 acres, sowed 175 acres, cut 175 acres, fallowed 40 acres and broke 10 acres. It will draw 125 bu. of wheat to the elevator at 4 m. p. h. and a 14-in. gang plow and harrow at the same speed. The cost of operation during the season was $140 and it performed the work of six horses and several extra men.



WHEN DE PALMA DOWNED HIS JINX—Captain Jinks of the Horse Marines had nothing on these motor marines, who made de Palma step so lively in downing his jinx Labor Day by winning the cup at Chicago, for which De Palma, Lewis, the Chevrolets, Alley, Henderson, Mason and Trekus contended